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Pregnancy Outcomes and Neo-Natal Mortality in Four Upazilas of Bangladesh

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Pregnancy Outcomes and Neo-Natal Mortality in Four Upazilas of Bangladesh

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Acknowledgements

This research product, like any other research, is an outcome of hard work of 122 investigators who worked in four teams— each one led by a Principal Investigator in four different Upazilas of Bangladesh : Gopalpur, Raipura, Godagari and Singra. This is the largest research on pregnancy outcomes and neo-natal mortality in Bangladesh, in terms of area covered and investigators involved. The research investigators deserve our appreciation.

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In conclusion, we want to foretell the readers that we have, in this report, presented primarily a descriptive analysis of only those key variables which we could mannually tabulate. We are progressing with our plan to computer analyse the huge data set and hope to share with you when they are done.

Dhaka
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Abstract

This report contains an analysis of the data of the study on Pregnancy Outcomes and Neo-natal Mortality conducted in four Upazilas of Bangladesh---Gopalpur in Tangail District, Raipura in Norsingdi, Singra in Natore and Godagari in Rajshahi. The specific objectives of the study were to :

- estimate the extent of various types of pregnancy outcomes: live birth, still birth, abortion, maternal and neo-natal mortality.
- identify the probable causes of maternal and neo-natal deaths.

A population of 6,652 pregnant women were under surveillance for a period of 13½ months beginning from January 1985 to mid February 1986 for various types of their outcomes. A set of ten instruments were used for collecting data on various practices during pregnancy, child birth, neo-natal and postpartum period.
Ninety two percent of the pregnancies yielded live births, the rests were pregnancy wastage through still births and abortions. The proportion of pregnancy wastages due to abortion, both spontaneous and induced combined, is higher than the proportion of still birth.

Areal variation seems to exist for all types of pregnancy outcomes, specifically for still birth and abortion. Raipura has the highest still birth and Godagari, the lowest. Abortion is highest in Singra and lowest in Gopalpur.

During the period of observation, January 1985 to mid February 1986, there were 6,121 live births and 29 maternal deaths. The maternal death rate was, therefore, 4.74 per thousand live births. Areal variation in maternal mortality exists between north western and south eastern zone.

The major causes of maternal death found were eclampsia/tetanus, haemorrhage due to abortion, retained placenta, excessive bleeding after delivery and sepsis/fever. From age 30, maternal mortality rates, 5 per 1000 live births rises with successive higher age groups to reach a peak of 9 deaths per 1000 live births for the age group 45-49. The risk of maternal mortality for the women aged 30 and over is 59 percent higher than that for the women aged less than 30.

There were 484 neo-natal deaths and the neo-natal death rate was, therefore, 79.1 per thousand live births. Gopalpur has the highest neo-natal mortality, 125.8 per 1000 live births, and Godagari, the lowest 38.0 per 1000 live births. Tetanus, pneumonia/fever/sepsis, birth trauma/asphyxia, diarrhoea and pre-mature delivery were reported major causes of neo-natal death. Neo-natal mortality rises from age 25 of the mother and peaks at ages 45-49.

Assuming that the causes of maternal and neo-natal deaths have been correctly diagnosed and classified, the important policy lesson learned from the findings of this study is that upto three-fourths of the maternal deaths and nearly the same proportion of neo-natal deaths are potentially preventable.

Maternal mortality caused by tetanus, eclampsia, sepsis, induced abortion, abortion-related haemorrhage, and retained placenta account for 76 percent of the maternal deaths. These deaths are preventable, if pregnancy care and pregnancy monitoring services from well-trained paramedics are available to the expectant mothers in their community. Preventive medical and treatment services for such causes of death do not require highly expensive and sophisticated hospital facilities. Deaths caused by pre and post-natal excessive bleeding and by difficult labour may be prevented by blood transfusion and caesarean section, both procedures requiring sophisticated obstetric facilities and medical skills beyond those of the paramedics. However, the paramedics can identify and refer the high risk women to the nearest hospital facilities.

Tetanus, pneumonia-fever-sepsis and diarrhoea, accounting for 73 percent of the neonatal deaths, are preventable. Tetanus deaths are preventable, if pregnant mothers are vacinated with TT

immunization; sepsis is treatable with antibiotics which can be administered by well-trained paramedics. Diarrhoeal disorders are preventable by appropriate hygienic practices and easily treatable.

Family Planning has long been recognized as a strategy for maternal and child survival, especially in developing countries like Bangladesh where MCH service networks are not well established and fully operative. Whereas the overall contraceptive prevalence rate (CPR) in Bangladesh is 30 percent, the CPR in the rural area where this study was conducted is even lower, at 23 percent. Family Planning prevents the deaths of infants, children and mothers; it is an effective and inexpensive way to reduce maternal and infant deaths. The frontline family planning workers through their effective services can help the women delay, space and determine the number of pregnancies and child births. Giving eligible women access to family planning information and services can, thus, increase contraceptive practice and help them achieve reduction in maternal and infant mortality.

Contents

I.	Introduction	1
II.	Study Area	1
III.	Rationale for Selection of Study Areas	2
IV.	Study Population	2
V.	Data Collection	4
VI.	Methods and Instruments of Data Collection	4
VII.	Field Organisation and Data Collection	5
VIII.	Definitions Used	6
IX.	Limitations of the Study	7
X.	Efforts to increase Reliability and Validity of the Data	8
XI.	Limited Data Analysed	8
XII.	Results :	8
	Pregnancy Outcomes	9
	Live Births	9
	Still Births	10
	Abortions	11
	Level of Mortality : Maternal Mortality	12-13
	Causes of Maternal Mortality	13
	Neo-natal Mortality	14-15
	Causes of Neo-natal Death	16
XIII.	Implications	17
	Appendices :	
	A. List of Villages in the Study Area 1,2,3 and 4	18-19
	B. Schedules	20-38
	C. Characteristics of the Study Areas	39
	D. Tables	40-50
	E. References	50

I. Introduction

The report contains an analysis of the data of the study on pregnancy outcomes, specifically maternal and neo-natal deaths. The study was a prospective one and conducted in four Upazilas of Bangladesh— Gopalpur in Tangail District, Raipura in Norsingdi, Singra in Natore and Godagari in Rajshahi. The observation period for study spreads over 13½ months, from January 1985 to mid February 1986.

Mortality information is, in general, either indirect in its nature, consisting of measures or indicators that reflect mortality without being pure mortality parameters, or derived from sample surveys. Sample survey data have been conducted in limited geographic areas and are based in small numbers. Hence the result of such surveys cannot be regarded as representative of the whole country. For example, during the 1950's a hospital based study in selected urban areas of Bangladesh estimated maternal mortality rate of 20 per thousand live births.[1] Another study conducted at Dhaka Medical College Hospital reported a maternal mortality rate of 34 per thousand live birth.[2] Both these investigations were limited to small samples and were influenced by the selectivity of the samples taken from hospital admissions. For the nation as a whole, maternal mortality rate was estimated at 6.6 per thousand live births in 1958, whereas the Pakistan Planning Commission (1966) announced a rate five times higher.[3,4] Rabinson (1967) suggested in his review of mortality in Pakistan that the rate could be as high as 40 per thousand live births. Although no cause specific death rate was collected, the final report of the population growth estimation (1971) inferred a minimum maternal mortality rate of 13 per thousand live births from the study conducted from 1962 to 1965.[5]

Most widely quoted maternal mortality rates for Matlab in 1967 and 1970 were estimated at 7.7 and 5.7 per thousand live births, respectively.[6] In 1978, a national survey was conducted to identify maternal death. The survey reported a maternal death rate of 5.4 and abortion related mortality rate of 1.9 per 1000,000 women aged 10 and over. The survey found eclampsia, obstructed labor and haemorrhage as major causes of maternal deaths. Induced abortion was estimated to be responsible for approximately 26 percent of all pregnancy related deaths in Bangladesh.[7]

The recent data from two localized studies, Tangail and Jamalpur, estimated the maternal mortality rate around 6 per thousand live births for 1982-83.[8,9]

In a recent study on neo-natal mortality in two rural Upazilas of Bangladesh (Gopalpur and Bhuapur) neo-natal mortality rate was found as 102.9 deaths per 1,000 live births. The leading cause of death was tetanus (63.3 percent) followed by asphyxia (17.1 percent) and prematurity.[10] Although misclassification of causes of death in some cases is likely given the relatively crude method used to assign cause of death, the predominance of tetanus is consistent with findings in Matlab area.

The objectives of the present study were to :

- estimate the extent of various types of pregnancy outcomes,live birth, still birth, abortion, maternal and neo-natal mortality.
- identify the probable causes of maternal and neo-natal deaths.

II. Study Area

The study was conducted in four Upazilas of Bangladesh—Gopalpur in Tangail District, Raipura in Norsingdi, Singra in Natore and Godagari in Rajshahi.

Gopalpur is situated about 85 miles away from Dhaka City and 25 miles away from District Headquarter of Tangail. It is connected with Dhaka by road. There are 8 rural and 3 urban unions in Gopalpur. Out of these 11 unions, the study area covered 41 villages (name of the villages in Appendix A) in 5 rural Unions— Jhawail, Hemnagar, Nagda Simla, Hadira and Mussuddi.

Raipura is about 45 miles away from Dhaka City. The Upazila is connected with Dhaka City by road and railway. There are 28 Unions in this Upazila of which the study area covered 30 villages (name of the villages in Appendix A) in 3 of the rural unions— Mahespur, Mirzapur and Musapur.

Singra is about 12 miles away from the District Headquarter, Natore and about 42 miles from Rajshahi town. It has 12 Unions of which the study area covered 94 villages (name of the villages in Appendix A) in 5 Unions— Hatiandah, Lalore, Sherkol, Singra and Kalam.

Godagari is situated 19 miles north-west of Rajshahi town. The Upazila has 9 unions of which the study area covered 74 villages (name of the villages in Appendix A) in 5 Unions— Matikata, Gogram, Godagari, Pakri and Deo-para.

Regarding availability of health services, only Godagari has an Upazila Health Complex in the project site. However, Gopalpur has 4 Family Welfare Centres (one under construction) and Singra has 3 Family Welfare Centres, only 2 of which are fully in operation. Neither Raipura nor Godagari has any Family Welfare Centre in the project site.

III. Rationale for Selection of the Study Area

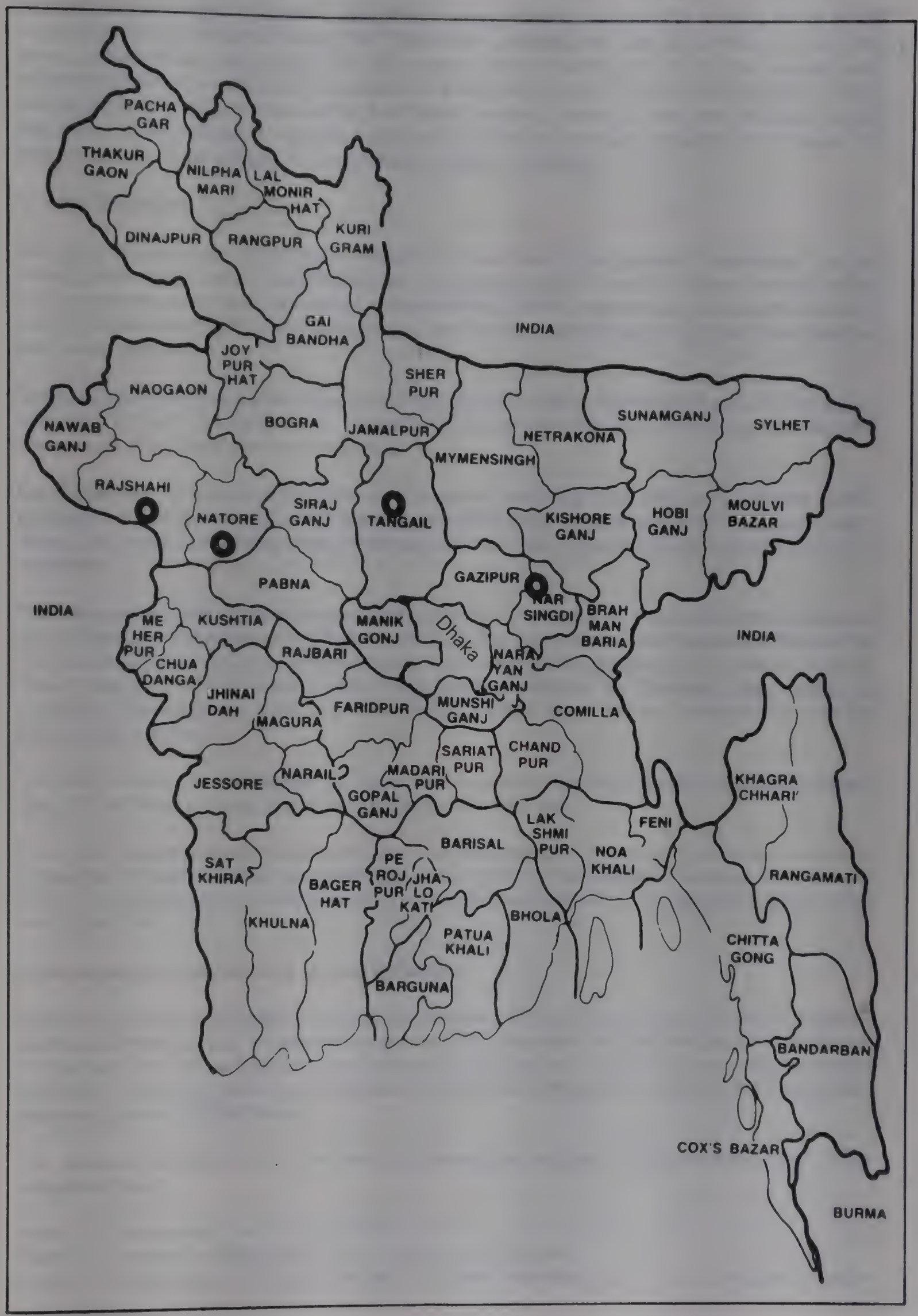
The for me Ford Foundation Representative, Ms. Adrienne Germain, requested the members of the research team to select study areas such that they roughly represent agro-climatic conditions of Bangladesh. The past studies on maternal mortality and pregnancy related practices were confined to the eastern zone of the country. In this study, attempts were made to select two areas from north western zone and two from south eastern zone in order not only to cover wider geographical regions but also to accomodate, as far as possible, the regional sub-cultural variations. It was therefore decided that two of the study areas (one from each zone) will be located in areas having intensive agricultural activities (indicated by cropping intensity and availability of irrigation facilities), and two in areas having less intensive agricultural activities. The general assumption was that, the rural areas with higher intensive agricultural activites will be a developed area having higher level of income (for all occupational categories) than in areas having less intensive agricultural activites. It was further assumed that family income together with socio-cultural base of the family will be signficantly related to various phase of pregnancy and birth management practices and care. However, attempts were made to avoid selecting areas having (a) intensive health care and MCH facilities (sponsored by government and NGOs), (b) significant non-agricultural occupational groups, and (c) typical socio-cultural groups (e.g. weavers, fishermen, tribal groups etc.) in order to make all four study areas together, representative of rural Bangladesh. Final selection of the study areas were made after exploratory field visits by the Principal Investigators and their associates.

IV. Study Population

It was decided by the researchers that population in each study area should be approximately 50,000 in order to have about 10,000 fertile women (assuming that about one fifth of the population are fertile women), so that there would be 1500—1800 pregnant women in each study (on the basis of pregnancy prevalance rate of 15—18 percent). They decided that all the identified pregnant women (irrespective of their duration of pregnancy during January-April 1985) will be selected for obtaining pregnancy outcome and for estimating neo-natal and maternal mortality rate. Decision was also made that a sub-group of women (who were pregnant for 2-3 months during January-April 1985) numbering not less than 400 in each study area, will be selected for longitudinal surveillance for comprehensive study of the pregnancy, child birth management and practices, and their possible effect on mothers and neonates.

In order to cover 50,000 population for each study areas, first, one Union was selected as center, then village falling around the surrounding periphery were added until a total of 50,000 population was obtained. This was done in the following way : Prior to the beginning of the actual

BANGLADESH MAP SHOWING DISTRICTS (STUDY AREAS)



implementation of data collection, each field investigator was assigned to make a list of all the households in her assigned area. The Supervisor compiled the lists (submitted by the Field Investigators) of the households and the number of the members of these households were examined whether or not 50,000 population were obtained. In case of shortfall he instructed his field investigators to list more households from other nearby villages to cover the proposed 50,000 population. In this process 41 villages were brought under the coverage of the study in Gopalpur, 30 villages in Raipura, 94 villages in Singra and 74 villages in Godagari.

V. Data Collection

The study consisted of two phases : a Baseline Survey and a Longitudinal Surveillance. The field investigation began with a baseline survey. The purpose of the baseline survey were to collect socio-economic status and demographic characteristics of the member of the households and to identify those women who were currently married and less than 50 years of age and determine their pregnancy status.

The baseline survey were conducted in two rounds : first, during the month of January to February and again in April. During January - February round, the currently married women who reported themselves to be pregnant were registered.

During the second round in April all the eligible women including those who were in doubts of their pregnancy status and or missed 2-3 monthly cycles but were not sure about their pregnancy status during first round of interview were reinterviewed; those who reported them to be pregnant were registered.

The pregnant women who were registered during both the rounds of the survey were categorized into two groups: Surveillance and Non-surveillance. The women who were registered pregnant for 2-3 months both during January-February and April rounds were categorized as surveillance group. These pregnant women were under longitudinal surveillance for collecting data relating to pregnancy management, food and work habits, health care, delivery management and the outcomes of the fetus.

The women who were pregnant for more than 3 months were categorized as non-surveillance group. From these women only outcomes data were collected.

The difference between surveillance and non-surveillance group is that, from the former, in addition to pregnancy outcomes data, data relating to cultural practices of pregnancy care and management, food and dietary intakes and work patterns were collected, while from the later only outcome data were collected.

VI. Methods and Instruments of Data Collection

Uniform surveillance variables, inventory of outcomes, probable risk factors, causes of death and estimates of the number of maternal and neo-natal deaths were used for conducting the study in all of the study sites. It was assumed that through maintaining uniformity it will be possible to compare research findings and thereby get a representative picture of pregnancy outcomes and maternal and neo-natal deaths in project sites.

Ten detailed sturctured forms (Appendix B) were used as data collection instruments. These schedules were :

Form 1 : Benchmark Form for every family.
Form 2 : Pregnancy Registration Form for all pregnant women.
Form 3 : Retrospective Maternal Mortality Form administered only in case of pregnancy related

death during last year, January - December, 1984 .

Form 4 : Pregnancy Surveillance Form administered to 2-3 months pregnant women.
Form 5 : Abortion Form administered if delivery occurred before or within seven months.
Form 6 : Delivery Form adiminstered immediately after delivery.
Form 7 : After Delivery Surveillance Form administered to the mother after delivery.
Form 8 : Neo-natal Death Form administered if the baby died within 28 days of birth.
Form 9 : Maternal Mortality Form adiministered if the women died during pregnancy or delivery or within 42 days of delivery.
Form 10: Death Form administered to all death except mother and neo-natal death.

These schedules were finalized after necessary pre-test. The schedules were in local language, Bangla but translated in English in order to communicate with English speaking researchers/experts. The benchmark form covered socio-economic information of the family including menstrual and pregnancy status of all fertile women in the family and their demographic characteristics. It also recorded all birth and death incidence (except maternal deaths for which a separate death form was used) which occurred in 1984 and covered information on availability and use of family planning methods. Pregnancy registration form was used for identification and enrolment of all pregnant women.

VII. Field Organization and Data Collection

Each study area was under the supervision of a Principal Investigator who had excellent records of producing scientific papers in home and abroad. Each Principal Investigator had one Research Associate, two Research Assistants, 4 Supervisors and 20-26 Field Investigators to assist him/her in executing the program. Each of the Principal Investigator had a part time doctor in his /her research team. Besides, each had supportive staff(typist, accountant, messenger) in order to carry out his/her specific responsibi- lities.

The field work in each study area was conducted independently but the same frame of work and procedure in data collection was used by all the Principal Investigators.

A project office was set up in each study area. Central office was located at Dhaka. In the central office, special arrangements were made so that the Principal Investigators and their Associates could meet in the central office from time to time to discuss any problems and develop strategies to overcome them.

Besides obtaining regular consultancy services from a regular panel of experts which consists of epidemiologist, medical professionals and social scientists, the Principal Investigators obtained technical assistance from experts of home and abroad in deciding use of surveillance variables, preparing analysis plans, making inventory of outcomes and probable risk factors, identifying causes of deaths, estimating the number of maternal and neo-natal deaths.

Data on the pregnant women and the new borns were collected through 80 field investigators (twenty for each project area). All these field investigators were female and are residents of the same locality from where they collected data. They were all matured, married and had enough education to follow written instruction and to write down events. Each of them received four weeks of training in order to orient themselves with the objectives and procedures of the study, preparing themselves for taking interviews and filling in different forms used for collecting data for the study. Training was given by Principal Investigators and their Associates.

Sixteen field superviors, 4 in each project area, supervised the field investigators. All the field supervisors of Gopalpur, Singra and Godagari were males while all the field supervisors were female in Raipura.

These field supervisors were responsible for supervising field activities, reviewing filled in schedules and forms, and submiting them to the Research Assistant for checking and verifications.

It should be mentioned that prior to data collection, each field investigator was required to prepare a list of families by the name of the heads of the families and their sizes. It helped her to acquaint herself with the study area.

After preparing the household list, she was given the task of interviewing eligible women through a structured interview schedule (Benchmark Form). In case of more than one eligible women in a family all the eligible women were interviewed. This was done mainly for listing eligible women as well as to know their pregnancy and menstrual status. In case of absence of eligible women she was instructed to interview the head of the family.

She was instructed to fill in Pregnancy Surveillance Form and After Delivery Surveillance Forms only for women who were 2-3 months pregnant. She was also instructed to fill in Abortion Form, Delivery Form, Neo-natal Death Form and Maternal Death Form for all the pregnant women registered (surveillance and non-surveillance). Besides she was instructed to fill in Death Form for all death indidence occured in 1985 except maternal and neo-natal deaths, for which separate forms were used.

She was also required to make three special visits to those fertile married women who were identified as 2-3 months pregnant during January to April 1985 and had live births within data collection period (January to December 1985). These special visits were made every fortnight after delivery upto 42 days to find out and fill in appropriate forms for neo-natal and maternal deaths.

She was also required to complete Delivery Form, Neo-natal Death Form and Maternal Death Form for incoming pregnant women and keep trace of outgoing pregnant women.

It was decided to complete appropriate forms for those pregnant women who have migrated to other villages but within the study area by the field investigators of that area. The field investigators were responsible for filling in forms for birth and death events.

VIII. Definitions used

1. Eligible Women	-	Currently married women of reproductive age, 10-49 years.
2. Ectopic Pregnancy	-	Pregnancy outside uterus.
3. Preterm Delivery/ Pre-mature Delivery	-	Delivery of the baby before completion of 37 weeks of gestation.
4. Live Birth	-	A complete expulsion of a product of conception, irrespective of the duration of the pregnancy, which have any sign of life after delivery.
5. Still Birth	-	Expulsion of fetus with no evidence of life.
6. Abortion	-	Termination of pregnancy before the fetus becomes viable.
7. Maternal Mortality	-	Death of any woman of any cause while pregnant or during delivery or within 42 days of termination of pregnancy, irrespective of the duration and the site of pregnancy.

8. Neo-natal Death	-	Death of any newborn infant of any cause within 28 days of brith.
9. Antepartum haemorrhage	-	Bleeding (from placental site) after 28th weeks of pregnancy and prior to birth of the baby. In this study antepartum haemorrhage means excessive bleeding before delivery.
10. Postpartum haemorrhage	-	Bleeding per vagina after the delivery of the baby. In this study postpartum haemorrhage means excessive bleeding after delivery.

IX. Limitations of the study

Several limitations of the study were indentified. These limitations are:

All the pregnancies in this study were enrolled in the Pregnancy Registration Form during the benchmark survey rounds, first round in January-February and second in April 1985. Those who became pregnant after that period and had pregnancy terminations prematurely (ectopic pregnancy, abortion or pre-term birth) their termination would occur during 1985. It seems very unlikely that a live or still birth or maternal or neo-natal death would escape the attention of the worker. Because at the later part of 1985, the workers would be intimately familiar with their communities. But abortion in this group might go unnoticed by the workers. Thus the rate of abortion for 1985 will be under-estimated.

Women enrolled for surveillance included those who were recognized as being 2-3 months pregnant during the months of January-April. Many in this group entered the third trimester during the "lean months" of July-August and that the outcomes of these pregnancies might not be representative of pregnancies during other seasons.

The health of the mother before pregnancy affects the outcome of pregnancy. Unfortunately it was not possible for us to obtain this information through the survey method.

Assessment of the duration of gestation in this survey was based on the women's statement of the number of months pregnant or by calculation based on the reported date of the last menstrual period (LMP). The researchers expressed concern that the date of LMP would be known to the month but not the day, i.e. number of periods missed but not calender day of the LMP. This might complicate the definition of premature birth, and thus premature birth (less than 37 weeks' gestation) might not be a measurable outcome.

Many spontaneous and induced abortions (including menstrual regulation) occur early in the first trimester. Women with these outcomes might not be enrolled in the surveillance group, particularly if the women were reluctant to acknowledge pregnancy, if they were planning abortion, or if women were reluctant to acknowledge that they had an abortion. Thus, the surveillance data might not yield accurate information of the incidence of abortion or on the safety of various forms of abortion (traditional versus MR).

Maternal death due to ectopic pregnancy might occur before the pregnancy is recognized. In the absence of medical services, the family might not recognize that death is related to pregnancy.

In Bangladesh many women, having their first pregnancy, often return to their mothers' home for delivery. This could result in loss of follow-up for some women under surveillance and inclusion of births in the 1985 counts. The researchers felt that this would be a minor problem since most of this type of migration was within each of the study areas.

X. Efforts to increase reliability and validity of the data

In each questionnaire, there was a built-in machanism for quality of data. In order to examine consistency of responses the researchers deliberately asked one or two questions which gave same type of information. Supervisors were required to visit the interviewers at a regular interval.

Besides, immediately after data collection, a report was prepared by the project staff on a sub-sample of 61,621 (approximately ⅓ of the study population) population in 4 study areas-Gopalpur, Raipura, Singra and Godagari. The data of the sub-sample is presented in Apprendix-C

XI. Limited Data Analyzed

The study covered a large population in four Upazilas of Bangladesh and yielded a collection of a huge amount of very pertinent data - both retrospective and prospective. The restrospective data on socio-economic and demographic variables were collected from 39,600 households and from 38,973 currently married women, respectively. The propspective data were collected from 6,652 pregnant women and the data collected from them relate to their food intake/habit during pregnancy and lactation, work pattern during pregnancy, pregnancy management and delivery practices, morbidity pattern during pregnancy, delivery and postpartum, and pregnancy outcomes - live births, stillbirths and abortion - both spnotaneous and induced, maternal and neonatal survival.

Due to several constraints - money, logistics, and time, all data could not even be attempted to analyze (the task of computer management of the data itself shall require at least 6 months). To fulfil the requirement of a report and to submit it rather timely, only the data on pregnancy outcomes have been analyzed and presented in this report. The data were analyzed manually, and as expected, the analysis remained primarily descriptive.

Negotiations are underway with the funding agency of this study, The Ford Foundation for appropriate analysis of the available data. With the financial support forthcoming, we hope that the available data shall be analyzed and the program managers, policy makers, and the researchers all shall benefit from them.

XII. Results

Taken together, in all the four areas, a total of 6,652 pregnant women were under observation for a period of 13 and half months, from January 1985 to mid February 1986. These pregnant women were identified from a population of 38,973 eligible women, defined as currently married and below 50 years of age. These eligible women constitute 17.51 percent of the total pupulation, 222,463 inhabiting the four geographical areas under the study (Table 1).

Table 1 : Total population and eligible women by study area

Study area	Total population	Number of eligible women	Percentage
Gopalpur	50,304	8,929	17.75
Raipura	52,785	9,063	17.16
Singra	59,349	10,555	17.78
Godagari	60,025	10,426	17.36
All areas	222,463	38,973	17.51

While there is no variation in the proportions of eligible women by study areas (Table 1), significant variation reported in the proportions of pregnant women (Table 2). The proportions of pregnancy reported range from 11.02 to 22.72 percent. The proportion of pregnant women identified in Gopalpur is highest, and that of in Raipura is lowest. The proportions of pregnant women in Singra and Godagari, though are not all that different from each other, but are lower than that of Gopalpur and markedly higher than that of Raipura. The marked low proportion of pregnant women in Raipura suggests a possibility of a significant undercount of pregnant women there.

Table 2 : Eligible women and number of pregnant women by study area

Study area	Number of eligible women	* Number of pregnant women	Percentage
Gopalpur	8,929	2,029	22.72
Raipura	9,063	999	11.02
Singra	10,555	1,885	17.85
godagari	10,426	1,739	16.68
All areas	38,973	6,652	17.06

* Excluding 28 pregnant women in Gopalpur, 13 in Raipura, 19 in Singra and 80 in Godagari who migrated out from the study area.

Pregnancy Outcomes

Data on pregnancy outcomes are presented in Table 3. The pregnancy outcomes considered in this table are live births, still births and abortions, both induced and spontaneous.

Table 3 : Pregnancy outcomes by study area

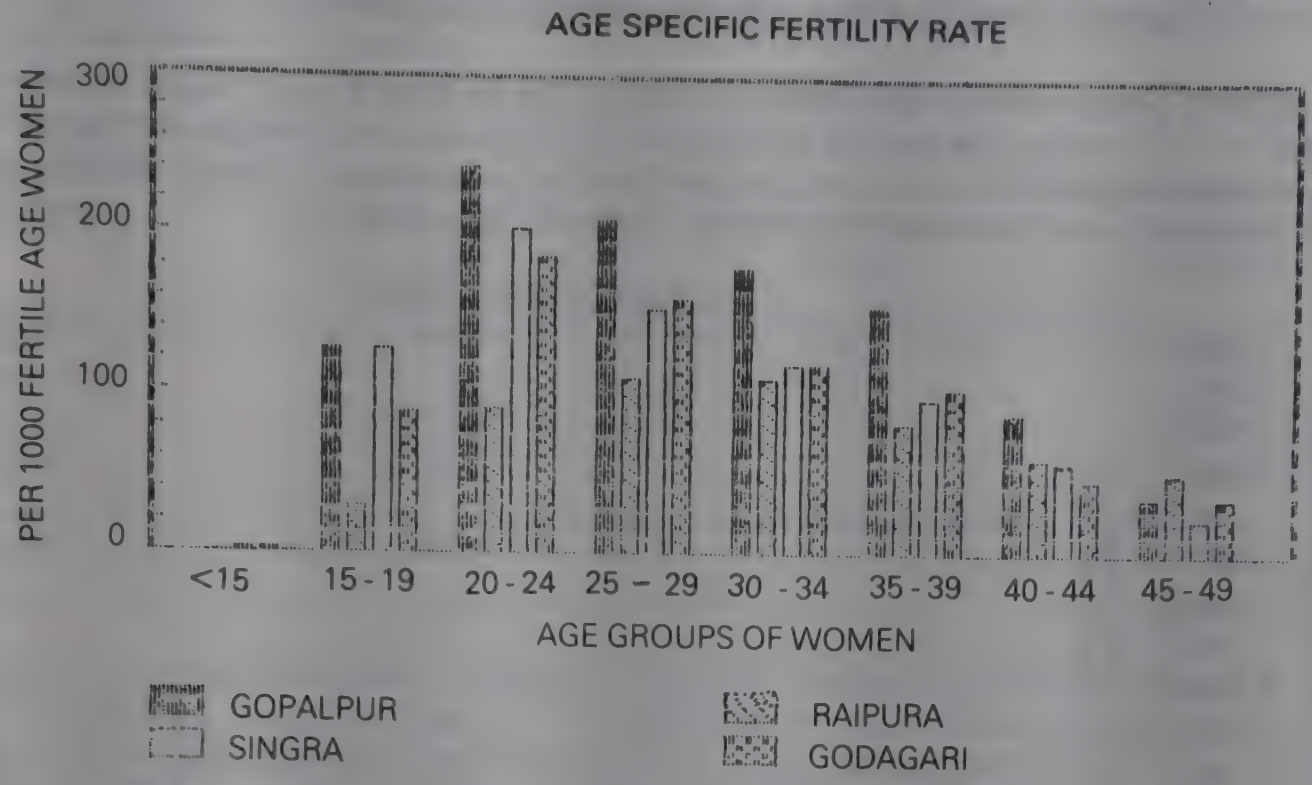
Study area	Live birth	Still birth	Abortion			Total
			Spontaneous		Induced	
Gopalpur	93.24	3.65	(39)	3.10	(24)	100.00
	(1892)	(74)				(2029)
Raipura	89.30	5.70	(40)	5.0	(10)	100.00
	(892)	(57)				(999)
Singra	90.60	3.40	(64)	6.0	(49)	100.00
	(1,708)	(64)				(1885)
Godagari	93.67	1.84	(69)	4.48	(9)	100.00
	(1,629)	(32)				(1739)
All areas	92.01	3.42	(212)	4.57	(92)	100.00
	(6121)	(227)				(6652)

Live Births

For every 100 pregnancy, 92 had live births, the remaining 8 pregnancies either had still births or abortions. The proportions of pregnant women who had live births range from 89.3 to 93.7 percent. In Godagari, the proportion of women who gave live births was highest, 93.7 percent and Raipura, lowest, 89.3 percent. (Table 3)

As expected, the fertility rate reaches the highest peak in the age group 20-24 and afterwards decreases with successively higher age group. Areal variation in fertility is conspicuous. Gopalpur has reported highest fertility in all age groups except in 45-49. Raipura has reported lowest fertility,

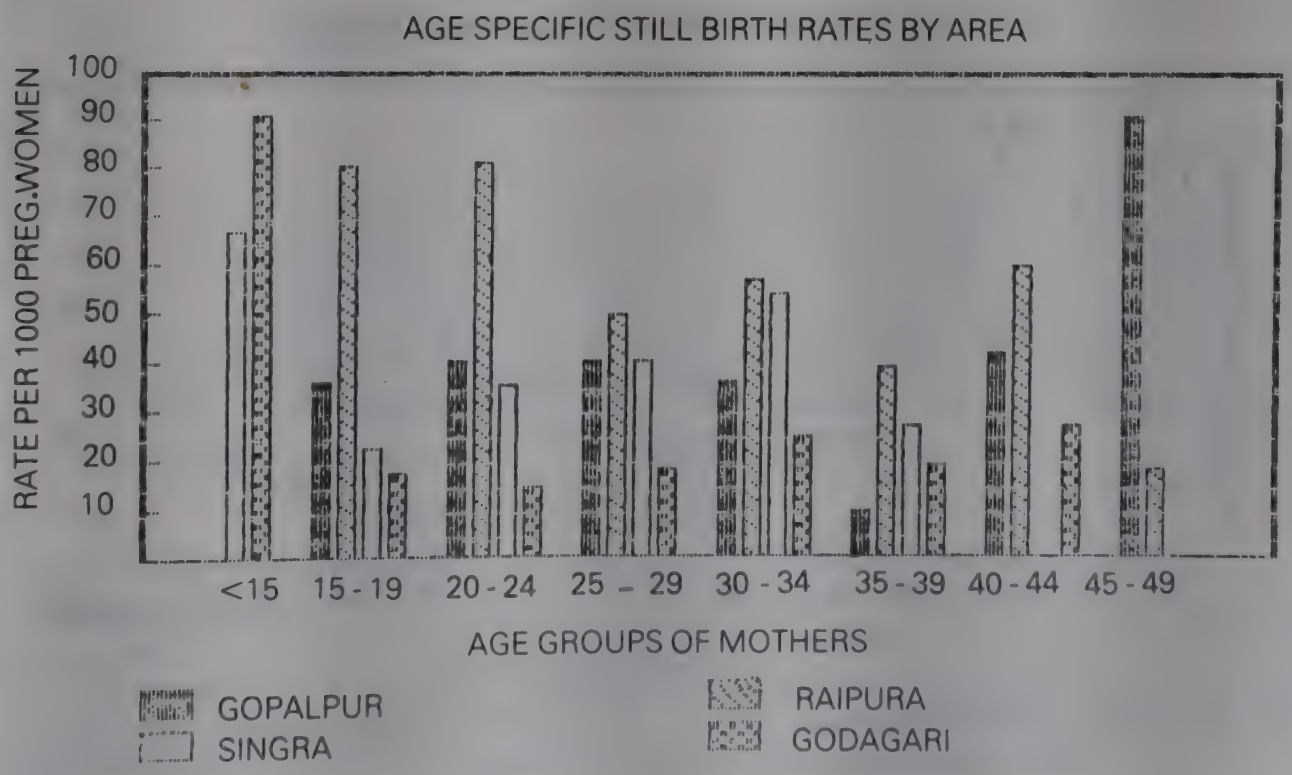
consistently for all age groups except for the age group 45-49. The levels of fertility for Singra and Godagari are lower than Gopalpur. While under registering of births is likely for both Singra and Godagari, the magnitude of under-registering of births for Raipura seems far greater than Singra and Godagari. (Table 7 : Appendix - D)



Still Births

At least three per 100 pregnant women had still births. The lowest rate of still birth, nearly 2 percent, was found for Godagari, the highest, 5.7 percent, found for Raipura (Table 3).

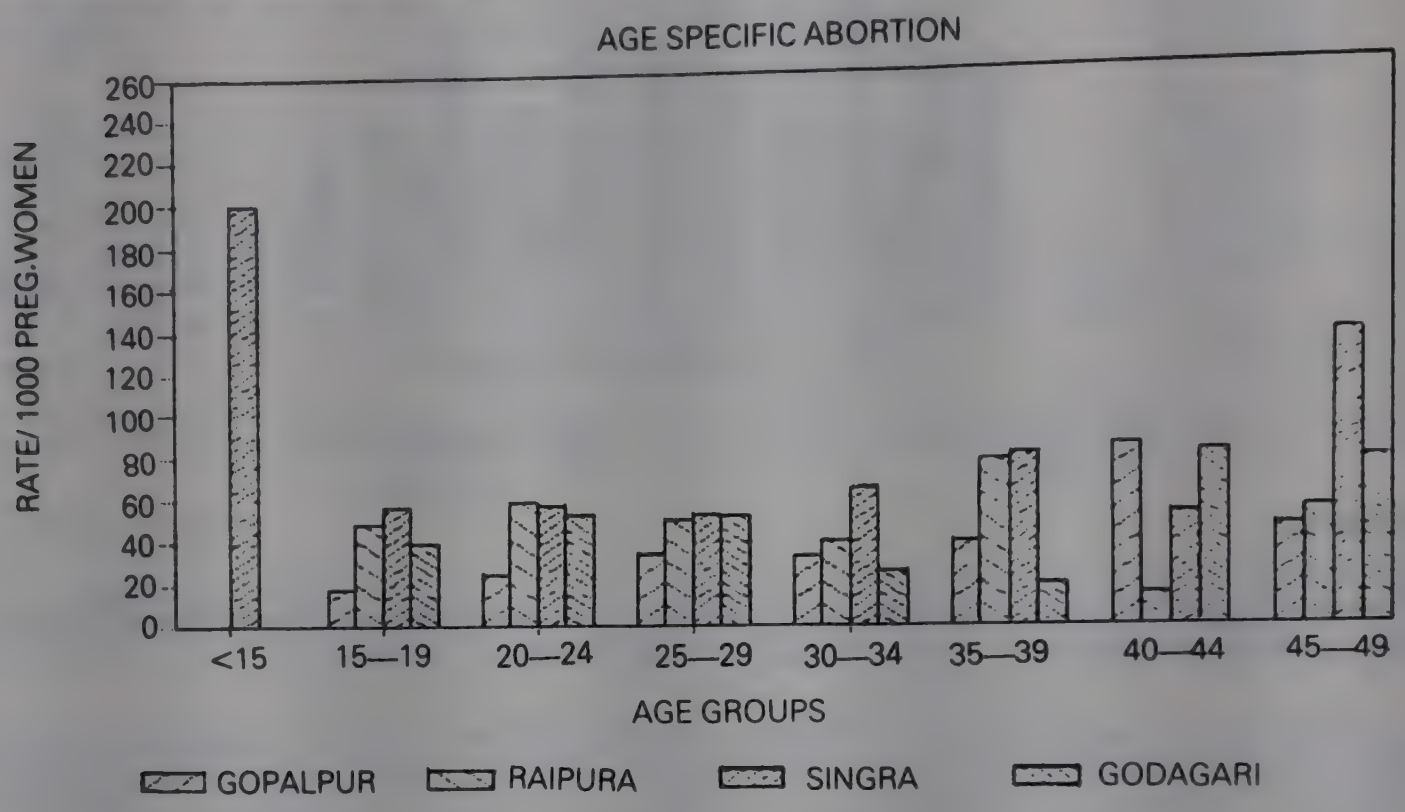
It is interesting to note that there are differences in still birth by project areas. No still birth is reported in the age group under 15 in the South Eastern zone, whereas there is high rate of still birth in this age goup in North Western zone projects. On the contrary, there are no still births in age 44-49 in North Western project areas. The still birth rate is very high in this age group in the South Eastern zone projects. (Table 4 : Appendix - D) The following graph presents age specific still birth rates by area.



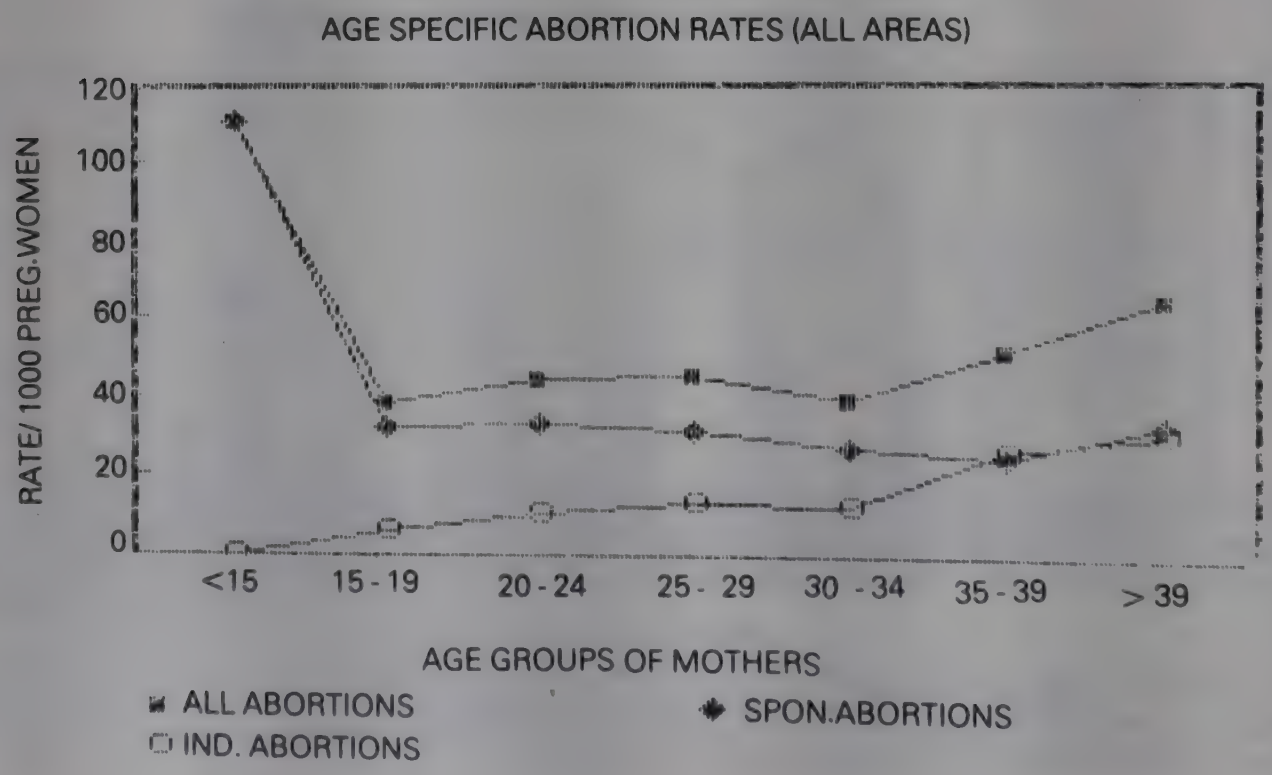
Abortions

Nearly 5 per 100 pregnancies were wasted through abortions both spontaneous and induced. Those who had pregnancy wastage, 30 percent of them had induced their fetus for expulsion and the remaining 70 percent had spontaneous expulsion of their fetus (Table 3).

The following graph presents age specific abortion rates by area. Except Singra no other project reported abortion among the women aged below 15. Singra reported considerably higher abortion rates for age groups 30-34 and 44-49 compared to other project areas. Overall, abortion seems to prevail more in the women aged 40 and over. (Table 5 : Appendix - D)



The likelihood of induced abortion increases with the increase in the age of the women.



Level of Mortality : Maternal Mortality

Maternal mortality data are presented in Table 4. The overall level of maternal mortality rate found in this study is 4.7 per 1000 live births. The levels of maternal mortality reported in this study are highest for Raipura and lowest for Godagari. The overall rate is lower than any other previous estimates available in the country.

Table 4 : Maternal rates by study areas

Study Area	Number of live birth	Number of maternal death	Rates per 1000 live births
Gopalpur	1892	9	4.75
Raipura	892	8	8.96
Singra	1708	7	4.09
Godagari	1629	5	3.06
All areas	6121	29	4.74

The following graph presents the relationship between maternal mortality and maternal age. It is observed that there was no incidence of maternal death among the women aged less than 15. The risk of maternal death rises slightly to 5.0 per 1000 live births for the age group 20-24 and again drops to 3.3 for the age group 25-29 and from age 30 the rates seem to rise with successively higher age groups to reach a peak of approximately 9 per 1000 live births. (Table 11 : Appendix - D). The risk of maternal mortality for the women aged 30 and over is 59 percent higher than the women aged less than 30. (Table 12 : Appendix - D).

Table 5 presents data by time of maternal death in relation to child birth. One-fourth of maternal death occurred prior to delivery and during delivery and the remainder post partum. 12 out of 29 deaths occurred during the first week post partum and the risk of maternal death declines sharply with succeeding week post partum. The risk of maternal death seems four times higher during the first week following child birth than during the second and third weeks.

Table 5 : Percent of maternal deaths by time of death in relation to child birth

Child birth status at time of death	No. of death	Percentage
Prior to delivery	7	24.14
During delivery	7	24.14
Post partum		
0-7 days	12	41.38
8-21 days	1	3.45
22-42 days	2	6.89
Total	29	100.00

The women who suffered pregnancy related deaths are, on the average 27 years old and typically had received no formal education. Nearly a fourth of these women were primigravida and the remaining had 1-10 living children, the average being 3.65. None, except one had previous abortion experience. At least half of the women belonged to economically hardship or deficit families. Except 3, all of the women received medical care of varying quallity, ranging from qualified physician to village folk-medicine practioner. (Table 16 : Appendix - D)

Causes of maternal mortality

The various probable causes of maternal death at specific stages of pregnancy or the post partum period are presented in Table 6. Tetanus accounts for the highest number of death, 11 out of 29 deaths. Haemorrhage, both before and after delivery and due to abortion, is the next highest cause of maternal deaths accounting for 9 deaths. Complications of labour and delivery accounted for 5 deaths, four were attributed to retained placenta and 1 to prolonged labour. Two deaths were caused by sepsis. One seventh of the maternal deaths are reported to have been caused by abortion, both spontaneous and induced combined.

Table 6 : Number of maternal death by cause and time of death in relation to pregnancy.

Causes of death	Number of maternal death											Total	Percentage
	Months anti-partum							During Delivery	Days Postpartum				
	3	4	5	6	7	8	9		0-7	8-21	22-42		
Tetanus/ Eclampsia/ convulsion						1		3	6		1	11	37.9
Sepsis/ fever/foul discharge									2			2	6.9
Excessive bleeding before delivery						1		1				2	6.9
Excessive bleeding after delivery									2	1		3	10.4
Haemorrhage due to abortion	1	2	1									4	13.8
Prolonged labour								1				1	3.4
Retained placenta								2	2			4	13.8
Induced abortion	1											1	3.4
Others										1		1	3.4
Total	2	2	1			2		7	12	2	1	29	100.0

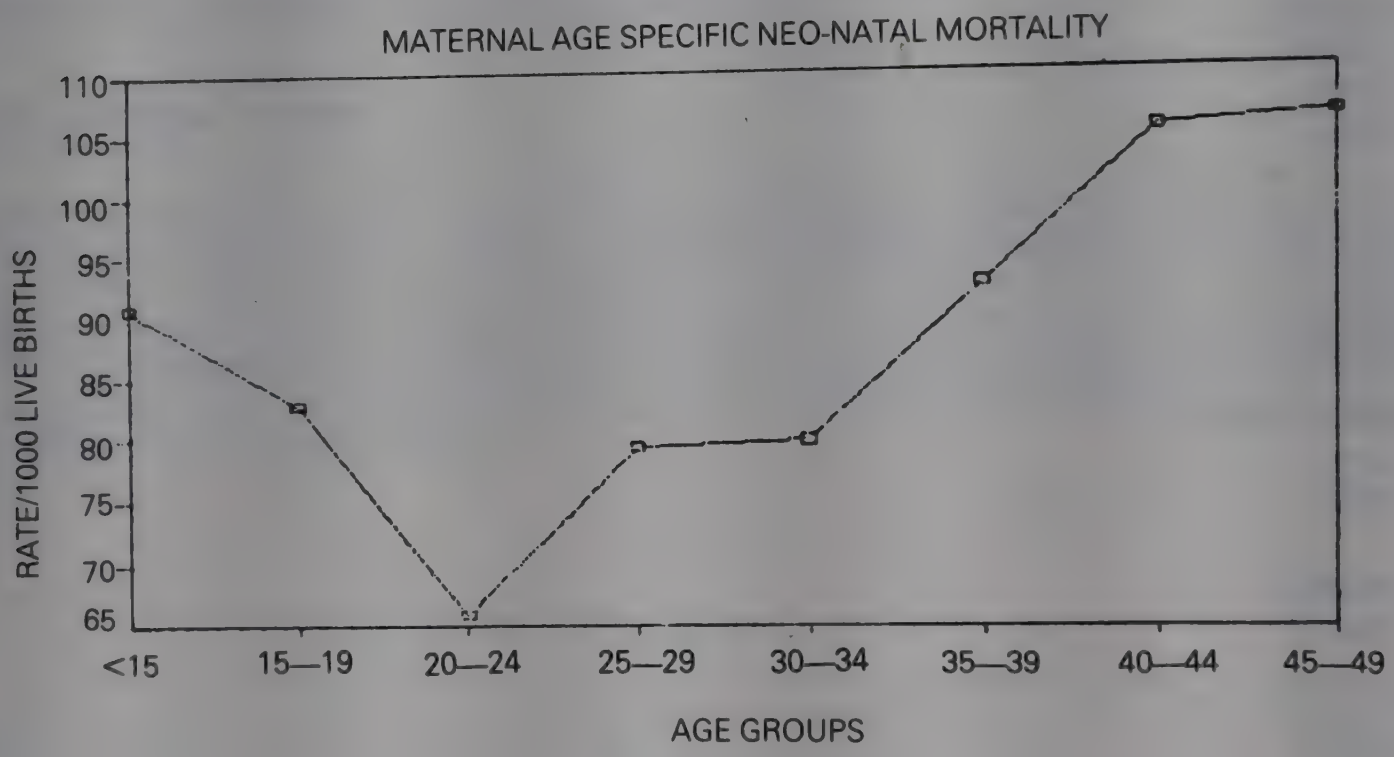
Neo-natal Mortality

Neo-natal mortality data are presented in Table 7. The overall level of neo-natal mortality rate is 79.1 per 1000 live births. The neo-natal mortality is the lowest in Godagari and the highest in Gopalpur. The neo-natal mortality rates are found to be lower in the north western zone than sourth eastern zone of the country. The neonatal mortality is so strikingly low in Singra and Godagari, than Gopalpur and Raipura that it deserves further investigation and analysis.

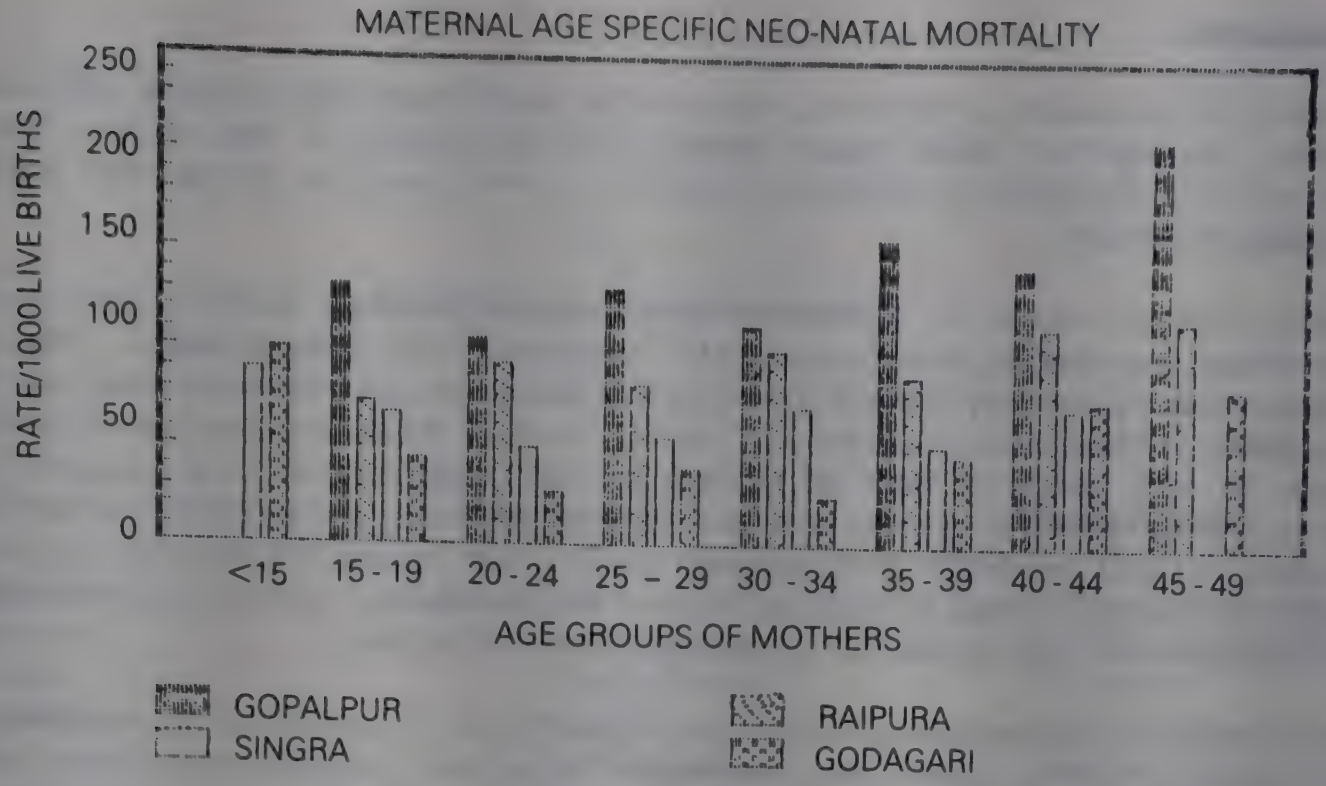
Table 7 : Neo-natal mortality rates by study areas.

Study areas	Number of live births	Number of neo-natal deaths	Rate per 1000 live births
Gopalpur	1892	238	125.8
Raipura	892	83	93.0
Singra	1708	101	59.1
Godagari	1629	62	38.0
All area	6,121	484	79.1

The following is the graphical presentation of maternal age specific neo-natal mortality. Neo-natal mortality is lowest, 66 per 1000 live births, among women, aged 20-24. Neo-natal mortality rates in other age groups, both lower and higher, are higher than age group 20-24. Neo-natal mortality starts rising from age 25 and peaks at age 45-49. However the magnitude of difference between the rates at the two extremes of age is not that great compared to the rates in the intervening ages, 15-34. The overall rate is around 80 per thousand live birth (Table 9 : Appendix - D).



The following graph presents maternal age specific neo-natal mortality rates by area. Neo-natal mortality rate in Gopalpur is highest in all age groups, except women aged below 15, while in Godagari neo-natal mortality rate is lowest in all age groups except age group 45-49. The neo-natal mortality in Raipura and Singra falls in between rates in Gopalpur and Godagari. When compared between north western and south eastern zone, the study area in the north western zone report lower neo-natal mortality (Table 9 : Appendix - D).



Causes of Neo-natal Death

The major causes of neo-natal mortality in order of frequency of death are tetanus, pneumonia, birth trauma/asphyxia, diarrhoea. In that order, tetanus is the primary cause of neo-natal death in all the four areas. Although the level varies, Godagari has the highest frequency of neo-natal death by tetanus while Raipura has the lowest.

Table 8 : Neo-natal Mortality by causes of death

Causes	Gopalpur		Raipura		Singra		Godagari		All area	
	Deaths	%	Deaths	%	Deaths	%	Deaths	%	Deaths	%
Prematurity	9	3.78	-		7	6.93	-	-	16	3.11
Birth Trauma/ Asphyxia	38	15.96	14	16.87	15	14.85	8	12.90	75	15.50
Tetanus	127	53.37	23	27.71	39	38.61	35	56.45	224	46.28
Pneumonia/Fever /Sepsis	45	18.90	24	28.92	22	21.78	9	14.51	100	20.66
Diarrhoea	-3	1.27	10	12.05	6	5.94	8	12.90	27	5.58
Congenital defect	-	-	-	-	1	0.99	1	1.61	2	0.41
Sudden death	-	-	-	-	2	1.98	-	-	2	0.41
Others	16	6.72	12	14.45	9	8.91	1	1.61	38	7.85
Total	238	100.0	83	100.0	101	100.0	62	100.0	484	100.0

XIII. Implications

Assuming that the causes of maternal and neo-natal deaths have been correctly diagnosed and classified, the important policy lesson learned from the findings of this study is that upto three-fourths of the maternal deaths and nearly the same proportion of neo-natal deaths are potentially preventable.

Maternal mortality caused by tetanus, eclampsia, sepsis, induced abortion, abortion-related haemorrhage, and retained placenta account for 76 percent of the maternal deaths. These deaths are preventable, if pregnancy care and pregnancy monitoring services from well-trained paramedics are available to the expectant mothers in their community. Preventive medical and treatment services for such causes of death do not require highly expensive and sophisticated hospital facilities. Deaths caused by pre and post-natal excessive bleeding and by difficult labour may be prevented by blood transfusion and caesarean section, both procedures requiring sophisticated obstetric facilities and medical skills beyond those of the paramedics. However, the paramedics can identify and refer the high risk women to the nearest hospital facilities.

Tetanus, pneumonia-fever-sepsis and diarrhoea, accounting for 73 percent of the neonatal deaths, are preventable. Tetanus deaths are preventable, if pregnant mothers are vacinated with TT immunization; sepsis is treatable with antibiotics which can be administered by well-trained paramedics. Diarrhoeal disorders are preventable by appropriate hygienic practices and easily treatable.

Family Planning has long been recognized as a strategy for maternal and child survival, especially in developing countries like Bangladesh where MCH service networks are not well established and fully operative. Whereas the overall contraceptive prevalence rate (CPR) in Bangladesh is 30 percent, the CPR in the rural area where this study was conducted is even lower, at 23 percent. Family Planning prevents the deaths of infants, children and mothers; it is an effective and inexpensive way to reduce maternal and infant deaths. The frontline family planning workers through their effective services can help the women delay, space and determine the number of pregnancies and child births. Giving eligible women access to family planning information and services can, thus, increase contraceptive practice and help them achieve reduction in maternal and infant mortality.

List of Villages in the Study Areas

Study Area 1

1. Uddampur
2. Simlapara
3. Sonaata
4. Hemnagar
5. Banamali
6. Uttar Bildaga
7. Dakshin Bildaga
8. Dakshin Pahtalia
9. Uttar Pathalia
10. Mazidpur
11. Jamtail
12. Mahmudpur
13. Bagua
14. Chatutia
15. Kariata
16. Khilpara
17. Gotengra
18. Pankata
19. Kakniaata
20. Ganipur
21. Hawail Bangha
22. Darbarpur
23. Bagbari
24. Harideb Bari
25. Harisha
26. Bhadai
27. Patiladubi
28. Ghoramara
29. Chhayaami Para
30. Gandail Dakuri
31. Darishaya
32. Bera Dakuri
33. Mouja Dakuri
34. Sonamui
35. Golabari
36. Kaheta
37. Pakutia
38. Mohail
39. Jhawail
40. Bhengula
41. Beripotal

Study Area 2

1. Pirpur
2. Purba Haripur
3. Shadhu Nagar
4. Anarabad
5. Kachari Kandi
6. Thana Kandi
7. Hogla Kandi
8. Kurarpar
9. Gouripur
10. Doulat Kandi
11. Karaipur
12. Shapmara
13. Pahar Kandi
14. Ghagtia
15. Pirij Kandi
16. Algi
17. Joy Nagar
18. Ram Nagar
19. Manik Nagar
20. Manda Lya
21. Mahmudabad
22. Maheshpur
23. Majobando
24. Puberchar
25. Mirzapur
26. Meratuli
27. Kukurmara
28. Musapur
29. Tula Tuli
30. Jhau Kandi

Study Area 3

1. Bara Hatiandaha
2. Chhota Hatiandaha
3. Kazipura
4. Chakpranpur
5. Uttar Shajuria
6. Arkandi
7. Dhighalgram
8. Nalbata Mridha Para
9. Nalbata Gupta Para
10. Nalbata Sardar Para
11. Malochbaria
12. Achalkot
13. Shalikha Mondal Para
14. Shalikha Taltali Para
15. Shalikha Shah Para
16. Hashighati
17. Kaligram
18. Dhuliadanga
19. Ulupur
20. Narayanpur
21. Mara Patia
22. Natun Bastee
23. Kazi Para
24. Panch Larua
25. Ag Larua
26. Bara Shail Natun Para
27. Bara Shail
28. Char Patkail
29. Haji Pur
30. Pat Shail
31. Kusha Bari
32. Lalore
33. Dak Mondap
34. Hamir Ghosh
35. Bara Baraihati
36. Bangal Para
37. Gopendra Nagar
38. Chhota Baraihati
39. Mohanpur
40. Raksha
41. Dhakdhore

42. Danga Para
43. Sonaidanga
44. Nalbata
45. Hapania
46. Nagar Mazgram
47. Bara Bari
48. Mazgram
49. Bandar
50. Ataikula
51. Panch Tikri
52. Bara Belgharia
53. Majgati
54. Neogirgram
55. Mathgram
56. Chhota Belgharia
57. Madarigram
58. Sherkul
59. Sherkul Agpara
60. Sherkul Maj Para
61. Kangshapur
62. Sree Rampur
63. Kandipara
64. Rani Nagar
65. Dhulauri
66. Harobaria
67. Pamgram
68. Puthimari
69. Panch Baria
70. Sonapur
71. Gualbathan
72. Shidhakhali
73. Baman Hati
74. Baktarpur
75. Teligaon
76. Nutanpara
77. Kuthirpara
78. Temukh
79. Chak Haripur
80. Bhag Nagar Kandi
81. Shahbazpur
82. Kharam Kuri
83. Mobkuri
84. Dur Mallika
85. Jur Mallika
86. Bil Bharat
87. Krishnapur
88. Chakpur
89. Khagar Baria
90. Balu Bharat
91. Ninguin
92. Sholemari
93. Nazarpur
94. Par Shail

Study Area 4

1. Ram Nagar
2. Srimantapur
3. Madarpur
4. Kella Baraipara
5. Mahishalbari
6. Achhua
7. Baruipara
8. Sarangapur
9. Saguna
10. Amritapur
11. Manju Kshar
12. Saidpur
13. Bilashi
14. Guni Gram
15. Kanait Kunda
16. Tera Para
17. Domdama
18. Brahmangram
19. Tikail
20. Jagapur
21. Birail
22. Barsipara
23. Dador
24. Gogram
25. Faradpur
26. Bhatpara Araji
27. Harin Biska
28. Sheikhpur
29. Bazaudpur
30. Sankarpur
31. Rani Nagar
32. Hazipur
33. Tili Bari
34. Saankura
35. Dhatma
36. Molla Para
37. Srirampur
38. Bat Tali
39. Kumurpur
40. Ujan Para
41. Bidirpur
42. Bara Gachi
43. Bhatopara
44. Pirijpur
45. Hazi Sankarpur
46. Basantapur
47. Khetur
48. Diar Mahabbatpur
49. Adar Para
50. Habaspur
51. Kroebaria
52. Machhmara
53. Rangamati
54. Gopalpur
55. Krishna Bati
56. Sona Dhighi
57. Sabaipur
58. Dadh Jhikra
59. Rasulpur
60. Bhajanpur
61. Kanthal Baria
62. Kismat Sakpal
63. Sekerpara
64. Dumuria
65. Matikata
66. Shaharagachi
67. Tajindrapur
68. Sabadipur
69. Badal Baraipara
70. Bijoy Nagar
71. Nazirpur
72. Kharija Gati
73. Chakchapal
74. Bara Kanai Danga

Appendix - B

Research on Maternal and Neo-Natal Health

1

Bench Mark Form

(For every family)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐

1. Information of the Family Members ☐

Serial No.	Name of the Members	Men	Women	Age			Education	Marital Status	Profession
				Year	Month	Day			
Head of the Family									
Respondent									
03									
04									
05									
06									
07									
08									
09									
10									
11									
12									

2. Is your Family Single or joint ☐ Single ☐ Joint
3. How much cultivable land do you have ? Own Bigha, Burga Bigha
4. How is your financial condition ?
   ☐ Surplus ☐ Deficit
   ☐ Solvent throughout the year ☐ In hardship
5. Is there any health and family planning centre around your locality ?
   ☐ Yes ☐ No
   ↓
   a) How far is it from your house ? Mile(s) ☐ Do not know
   b) Did you or anyone of your family go to the health centre in the last one year ?
      ☐ Yes ☐ No
      • How many days ago ? • Why not ?
      • For what purpose ?

6. Did any family planning worker come to your house ?

☐ Yes

● How many days ago ? Day Month

7. The information of the babies who were born in your family in the last one year (from last Agrahayan till this Poush) :

Sl.No.	Male	Female	How many days/ months ago the baby was born		In which month the baby was born	Mother's name	Mother's age	Is the baby still alive				
			Day	Month				Alive	dead			
									In which month	Age of the baby at the time of death		
										Day	Month	Year
01												
02												
03												

8. The information of those who died in your family in the last one year (from last Agrahayan till this Poush) :

Sl.No	Male	Female	In which month he/she died.	How many days/ months she ago he/ died		Age at the time of death			Marital Status of the deceased				
				Day	Month	Year	Month	Day	Married	Widow	Divorced	Separated	Unmarried
01													
02													
03													

(Fill up Retrospective Maternal Mortality Form if the deceased was female, under 49 years of age, married and died during pregnancy & child birth)

9. Write down the names of the women whom you have identified as married and of 49 years of age or less to the answer of question No. 1 and take the following information separately from everyone.

Sl. No.	Name of the women	Whether pregnant at present		Whether they use any method of family planning at present (Those who are not pregnant)		How many babies were born to you in total	How many babies are alive
		Yes (For how many months)	No (How many periods missed)	Yes (Name of the method)	No		
01							
02							
03							
04							

↓ Fill up the Pregnancy Registration Form

↓ For those who have missed 2-3 cycles. Fill up the Pregnancy Registration Form if applicable on subsequent interview.

Signature of the Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisc
Date :

Research on Maternal and Neo-Natal Health

2

Pregnancy Registration Form

(For all pregnant women)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐☐☐

1. Name of the woman :
2. Name of the husband :
3. Had you ever been pregnant prior to this pregnancy ? ☐ Yes ☐ No

↓

a) How many times had you been pregnant besides the present one ?
b) How many living children you have so far delivered ?
c) How many children are alive at present ?
d) How many still births did you have ?
e) How many abortions did you have ?.... Times

☐ Spontaneous
☐ Induced

4. When did you have your last period ?
5. To whom you generally go for help or advice for pregnancy related problems ?

☐ Relatives ☐ Friends
☐ Midwife/Dai ☐ Family Planning Worker
☐ Neighbour ☐ Doctor
☐ Others (specify)

6. Who will take decision if any emergency or problem relating to pregnancy arises ?

☐ Yourself
☐ Others (specify)

Signature of Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisor
Date :

Research on Maternal and Neo-Natal Health

3

Retrospective Maternal Mortality Form

(In case of pregnancy related death from last Agrahayan till this Poush)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐☐☐

1. Name of the woman :
2. Date of death :
3. Age at the time of death :
4. At what stage of pregnancy she died ?

☐ Before the labour pain started → Duration of pregnancy : Month(s)

☐ After starting of labour pain but before delivery →

a) Duration of pregnancy : Month(s)
b) Duration of labour pain : Hour(s) Day (s)

☐ By giving still birth →

a) Duration of pregnancy : Month (s)
b) Date of delivery :

☐ After giving live birth → Date of delivery :

☐ Died after abortion
↓
a) How many months she was pregnant for ? Month(s)
b) Date of Abortion :
c) Type of abortion :
☐ Induced ☐ Spontaneous
↓
d) Who did the abortion
☐ Self ☐ Relatives
☐ Midwife→ ☐ Trained ☐ Health & Family Planning Worker
☐ Not trained ☐ Others (specify)
e) Place of abortion
☐ Home ☐ Govt. Health Centre/Hospital
☐ Private Health Centre ☐ Others (specify)
f) How the abortion was done ?

5. Which of the following symptom(s) was/were present before death ?

- ☐ Fever
- ☐ Excessive bleeding
- ☐ Died suddenly
- ☐ Others (specify)
- ☐ Convulsion/Tetanus
- ☐ Obstruction of Placenta
- ☐ Oedemia/Inflamation of the extremities

6. If treated, what was the mode of treatment ?

- ☐ No treatment was given
- ☐ Enchantment/Tabij
- ☐ Kabiraji/Hekimi
- ☐ Homeopathic
- ☐ Allopathic

Signature of Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisor
Date :

Research on Maternal and Neo-Natal Health

4

Pregnancy Surveillance Form

(For 2-3 Months' pregnant woman)

Village :
Union :

Project No :
Village No :
Family No : ☐
☐

1. Name of the woman

2. Name of the husband

Questions	Possible answers	Visit/Inspection (To be inspected in every alternate month)					
		1st	2nd	3rd	4th	5th	6th
1. Do you have any ailment/disease following pregnancy ? If yes, please specify.	No ailment						
	Excessive headache						
	Excessive nausea						
	Bleeding like oil						
	Bleeding of other colour						
	Swelling of feet						
	Others (specify)						
2. In case of ailment, did you undergo any treatment ? If yes, please specify.	Not applicable						
	Did not undergo any treatment						
	Enchanting/Tabij						
	Kabiraji						
	Homeopathic						
	Allopathic						
3. Please specify the cause if not underegone any treatment	Not applicable						
	Ailment was not serious						
	Indifferent attitude of family members						
	Lack of nearby health centre						
	For own ignorance						
	Financial insolvency						

Questions	Possible answers	Visit/Inspection					
		1st	2nd	3rd	4th	5th	6th
4. Did you get yourself checked-up, in respect of pregnancy, by anyone ? If yes, please specify.	Did not get checked-up						
	Got checked-up by regd. doctor						
	Got checked-up by family planning & health worker						
	Got checked-up by village doctor						
	Others (specify)						
5. Did any health worker or family planning worker visit you in last one month ? If so, please specify	Nobody visited						
	To check-up health						
	To give medicine/ vitamins						
	To give advice in respect of food						
	To give advice in respect of health						
	Others (specify)						
6. What did you take in last 24 hours ?	Rice/Bread						
	Pulses						
	Fish/Meat/Egg						
	Milk						
	Vegetable						
	Fruit						
	Others (specify)						
7. Are you taking more, less or same quantity of food now compared to that of pre-pregnancy	More than before						
	Less than before						
	Same as before						
8. Are you taking any special food for the betterment of your and your un-born baby's health ? If yes, specify.	Not taking any special food						

Questions	Possible answers	Visit/Inspection					
		1st	2nd	3rd	4th	5th	6th
9. If no special food taken as per question No. 8, specify reason.	Financial insolvency						
	Indifferent attitude of the family members						
	Others (specify)						
10. What are the items you do not take which are harmful for you and your un-born baby ?	Tobacco leaf						
	Smoking						
	Others (specify)						
	Nothing						
11. What were the jobs you did yesterday ?	Lifting of water/ heavy things						
	Washing of heavy clothes						
	Thrashing of Paddy						
	Others (specify)						
	Did not do anything						
12. Does your baby move ?	Moves						
	Does not move						
13. How many days your husband was away from home in last month	Write down the correct number of days						
14. Present condition of pregnancy	Continuing						
	Given birth to live baby						
	Given birth to dead baby						
	Miscarriage/Abortion has occured						
Signature of Research Assistant							
Signature of Interviewer							
Signature of Supervisor							

Research on Maternal and Neo-Natal Health

5

Abortion Form

(If delivery occurs before or within seven months)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐☐☐

1. Name of the woman :
2. Name of the husband :
3. Date of Abortion :
4. Type of Abortion

☐ Induced ☐ Spontaneous

↓

a) Who performed the Abortion

☐ Self
☐ Dai/Midwife→ ☐ Trained ☐ Untrained
☐ Relatives
☐ Health & Family Planning Worker
☐ Others (specify)

b) Place of Abortion

☐ Home
☐ Govt. Health Centre/Hospital
☐ Non-Govt. Health Centre
☐ Others (specify)

c) How the Abortion was performed ?

5. Did you suffer from fever after Abortion ?

☐ Yes ☐ No

↓

a) How many days after the Abortion fever came ? Day(s)

b) How long did the fever last ? Day(s)

6. Was any treatment given for fever ?

☐ Yes ☐ No

↓

What type of treatment ?

☐ Allopathic (Regd. doctor)
☐ Paramedic/Village doctor
☐ Homeopathic
☐ Hekimi/Kabiraji
☐ Herbal medicine
☐ Others (specify)

7. Did you have any discharge with bad odour after the Abortion ? ☐ Yes ☐ No

8. How was the flow of bleeding after the abortion ?

☐ Excessive ☐ Normal ☐ Little

What did you use to check bleeding ?

↓

☐ Cloth →
☐ Cotton →
☐ Others (specify)
☐ Nothing
☐ Washed
☐ New
☐ Unwashed
☐ Of old quilt/mattress

9. What did you do to check excessive bleeding ?

- ☐ Consulted doctor
- ☐ Consulted Paramedics/Village doctor
- ☐ Others (specify)
- ☐ Administered home-made herbal medicine
- ☐ Did not do anything

Signature of Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisor
Date :

Research on Maternal and Neo-Natal Health

6

Delivery Form

(In case of mothers—immediately after delivery)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐☐☐

1. Name of the woman : 2. Name of the husband :
3. Pregnancy Outcomes : ☐ Abortion (Use Abortion Form) ☐ Still Birth ☐ Live Birth
4. What preparation did the family undertake for the delivery ?
   (more than one answer is possible)
   - ☐ Arrangement for trained Dai service was made.
   - ☐ Arrangement for Dai Service was made.
   - ☐ Relatives were kept informed of the situation.
   - ☐ No arrangement was made.
   - ☐ Arrangement for Health and FP Worker's Service was made.
   - ☐ For cutting Umbilical Cord, instrument and cotton was kept ready.
   - ☐ Nobody was informed.
5. Where was the baby born ?
   a) ☐ Bedroom
      ☐ Open Terrace
      ☐ Kitchen
      ☐ Room specially made for the delivery
      ☐ Hospital/Clinic
      ☐ Others (specify)
   b) Where did the birth take place ?
      (State about the Cleanliness, Ventilation, Fumigation and the place where the baby was kept after delivery)
6. Who did the delivery ?
   - ☐ Midwife → ☐ Trained
     ☐ Untrained
   - ☐ Health & FP worker
   - ☐ Relatives (specify)
   - ☐ None
   - ☐ Others (specify)
7. How long the labour pain lasted (from the beginning of the Labour Pain till the birth of the baby) ? Day(s) Hour(s)
8. How many hours before the delivery, the discharge of water took place ? Hour(s)
9. What was the colour of water ? ☐ Clear as water ☐ Bloody ☐ Greenish / Brown
10. Was the delivery normal ? ☐ Normal ☐ Abnormal/Difficult
11. Which part of the body came first during delivery?
    - ☐ Head
    - ☐ Other part of the body (specify)
12. Was there excessive bleeding during delivery ?
    - ☐ Yes
    - ☐ No
13. Was there one baby or Twin ?
    - ☐ One
    - ☐ Twin
14. Was the baby male or female ?
    - ☐ Male
    - ☐ Female

15. Was the baby born alive ?

☐ Live Birth

↓

When did the baby cry after birth ?

☐ Immediately ☐ Cried afterwards ☐ Caused to cry

☐ Still Birth

↓

How many days before the delivery the baby stopped moving ?

16. What was the size of the baby ?

☐ Smaller ☐ Normal

17. What was used for cutting the Umbilical Cord ?

☐ Blade → New — Old

☐ Bumboo Split ☐ Knife ☐ Others (specify)

18. Was the Umbilical Cord tied before cutting ?

☐ Yes → with what ? ☐ No

19. Was the instrument for cutting Umbilical Cord boiled ?

☐ Yes ☐ No

20. When the Cord was cut ?

☐ Before expulsion of Placenta ☐ After expulsion of Placenta

21. Was anything applied for early dryup of the Cord ?

☐ Yes → what ☐ No

22. How long after the birth the Placenta got expelled ?

☐ Within half-an-hour ☐ Half-an-hour or more

23. What measure was taken to expel the Placenta ?

☐ No measure was taken ☐ Inserting hand

☐ Putting hair in the mouth ☐ Pulling out the Cord

☐ Applying pressure on the abdomen ☐ Others (specify)

24. What was the extent of bleeding before the expulsion of the Placenta ?

☐ Normal ☐ Excessive

25. What was the extent of bleeding after the expulsion of the Placenta ?

☐ Normal ☐ Excessive

26. In case of excessive bleeding what measure was taken to control bleeding ?

☐ Consulted doctor (Regd. Allopath) ☐ Administered herbal medicine

☐ Consulted Paramedics/Village doctor ☐ Nothing was done.

27. What are/were you using to check after delivery menstruation ?

☐ Cloth → Washed — Unwashed

☐ Cotton → New — Of old quilt/Mattress

☐ Others (specify) ☐ Not using anything

28. When and what are the foods first taken after delivery ?

a) What are the foods ? b) After how many hours ? —Hours

(In case of live birth, ask Question Nos : 29-31)

29. What kind of food was given to the baby first ?

☐ Honey ☐ Breast milk

☐ Sweetened water prepared with sugar/candy ☐ Others (specify)

30. When did you start breast feeding ?

☐ Immediately after birth ☐ Within 12-24 hours

☐ Within 12 hours ☐ After 24 hours.

31. Did you start feeding your baby after expelling the 1st flow of milk ?

☐ Yes → Why ?

☐ No

Signature of the Research Assistant
Date :

Signature of the Interviewer
Date :

Signature of the Supervisor
Date :

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7

After Delivery Surveillance Form

(For mother—after delivery)

Project No. :
Village No. :
Family No. :

Village :
Union :

1. Name of the woman

2. Name of the husband

Questions	Possible answers	Visits/Inspections (to be made after every 14 days)		
		Ist	2nd	3rd
1. Did you suffer from fever since we met you last ? If so, for how many days ?	No			
	Yes (specify days)			
2. How is your menstruation now ?	Scanty			
	Normal			
	Excessive			
3. Did you have any menstruation with bad odour since we met you last ? If so, for how many days ?	No			
	Yes (specify days)			
4. What sort of material do you use for controlling menstruation ?	New cloth			
	Old cloth			
	New cotton			
	Old cotton			
	Others (specify)			
	Nothing			
5. Are you taking any special food for quick recovery ? If so,what are those ?	Not taking any special food			
6. Are you taking any special food for increased supply of breast milk ?				
	Not taking any special food			

Questions	Possible answers	Visits/Inspections (to be made after every 14 days)		
		Ist	2nd	3rd
7. What are the works you are doing at present ?	Cooking			
	Dish washing			
	Supervising household works			
	Clothes washing			
	Lifting/carrying water			
	Entertaining guests			
	Husking /Thrashing paddy			
8. How is your baby at present ?	Well			
	Suffering from fever present ?			
	Suffering from cold			
	Vomits			
	Does not eat properly			
	Suffering from scabies			
	Suffering from diarrhoea			
	Has died (Neo-Natal Death Form)			
9. If the baby is alive what are you feeding the baby at present ?	Only breast milk			
	Other foods with breast milk			
	Other foods but no breast milk			
10. Specify if other foods are given to your baby.	Sweetened water			
	Cow/Goat Milk			
	Baby food			
	Others (specify)			
	Not applicable			
11. Is your breast milk sufficient for your baby ?	Sufficient			
	Insufficient			

Questions	Possible answers	Visits/Inspections (to be made after every 14 days)		
		Ist	2nd	3rd
12. Did any Family Planning Worker visit you ? If so, for what purpose ?	Did not visit			
	To check-up health			
	To enquire about the baby			
	To advise about maternal and child health			
	To advise about food			
	Others (specify)			
Signature of Interviewer Date :				
Signature of Supervisor Date :				
Signature of Research Assistant Date :				

Research on Maternal and Neo-Natal Health

8

Neo-Natal Death Form

(If the baby dies within 28 days of birth)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐☐☐

1. Name of baby's mother :
2. Name of baby's father :
3. Date of death of the baby :
4. Age at the time of death of the baby :
5. What were the symptoms & causes of death ? (Describe)

6. Which of the following diseases the baby suffered from before death ?

Name of disease	How many days after the birth, the disease appeared
a) Cold/Cough	
b) Fever	
c) Vomiting	
d) Stopped taking food	
e) Convulsion/Tetanus	
f) Diarrhoea	

↓

Did you stop breast feeding the baby

☐ Yes ☐ No

7. Was any treatment given ?

☐ Yes ☐ No

↓

☐ Doctor (Regd. Allopath)
☐ Homeopath
☐ Paramedics/Village Doctor
☐ Herbal Medicine
☐ Others (specify)

Signature of Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisor
Date :

Research on Maternal and Neo-Natal Health

9

Maternal Mortality Form

(If the woman dies during
pregnancy or within 42 days of delivery)

Project No. :
Village No. :
Family No. : ☐ ☐

Village :
Union :

1. Name of the woman :
2. Name of the husband :
3. Name of the respondent :
4. Relationship of the respondent with the deceased :
5. Date of death :
6. At what stage of pregnancy she died ?

☐ Before the Labour Pain was due → Duration of pregnancy Month (s)

☐ During Labour Pain but before delivery →
a) Duration of pregnancy Month (s)
b) How long Labour Pain lasted Day(s) Hour(s)

☐ After giving Still Birth →
a) Duration of pregnancy Month (s)
b) Date of delivery

☐ After giving Live Birth → Date of delivery

☐ After Abortion

↓

a) How many months she was pregnant for ? Month (s)
b) Date of Abortion
c) Type of Abortion

☐ Induced ☐ Spontaneous

↓

d) Who performed the Abortion ?

☐ Self ☐ Relatives
☐ Midwife → ☐ Trained ☐ Health & Family Planning Worker
☐ Untrained ☐ Others (specify)

e) Place of Abortion

☐ Home ☐ Non-Govt. Health Centre
☐ Govt. Health Centre /Hospital ☐ Others (specify)

f) How was the Abortion performed ?

7. What were the symptoms & causes of her death (Describe)?
8. Which of the following symptoms did you observe before her death ?

☐ Fever ☐ Convulsion/Tetanus
☐ Haemorrhage ☐ Obstruction of Placenta

9. Who was called in for treatment ?

☐ None
☐ Doctor (Reg. Allopath) → ☐ Govt. ☐ Private
☐ Paramedics /Village doctor
☐ Homeopath
☐ Kabiraj/Hekim
☐ Others (specify)

10. How long before the death treatment was given ?

☐ No treatment was given
☐ Just before death
☐ Some days before the death (specify time)

Signature of Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisor
Date :

Research on Maternal and Neo-Natal Health

10

Death Form

(All deaths except mother and child death)

Village :
Union :

Project No. :
Village No. :
Family No. : ☐☐☐

1. Name of the deceased :
2. Deceased → ☐ Male ☐ Female
3. Date of death :
4. Age at the time of death : Year(s) Month(s)
5. Cause of death (specify symptoms & indications) :

6. Arrangement for treatment :
   - ☐ Doctor (Regd. Allopath) → ☐ Govt. ☐ Private
   - ☐ Paramedics/Village doctor
   - ☐ Homeopath
   - ☐ Hekimi/Kabiraji
   - ☐ Herbal
   - ☐ Others (specify)
   - ☐ No treatment was given

7. Place of death :
   - ☐ Hospital ☐ Home
   - ☐ Others (specify)

Signature of Research Assistant
Date :

Signature of Interviewer
Date :

Signature of Supervisor
Date :

Appendix - C

Characteristics of the study areas.

			Gopalpur	Raipura	Singra	Godagari
Population	Total	:	14,073	14,109	18,994	15,757
	Male	:	7,329	7,453	9,750	8,139
	Female	:	6,744	6,656	9,244	7,618
Family size			5.31	5.334	5.78	5.80
Number of Women less than 50 years and currently married		:	2,467	2,429	3,370	2,852
Family Type	Joint	:	720	596	607	612
	Nuclear	:	1,928	2,049	2,682	2,095
Families by Economic Status	Surplus	:	261	405	396	112
	Solvent	:	613	591	1,043	800
	Decifit	:	653	659	662	434
	Extreme Deficit	:	1,121	990	1,179	1,361
Average number of children ever born		:	3.59	3.58	3.64	3.69
Average number of children Currently living		:	2.66	2.66	3.03	3.04
Crude Birth Rate		:	36.03	35.36	36.75	33.90
Crude Death Rate		:	12.72	8.29	7.79	11.70
Literacy Rate	Total	:	33.29	26.24	32.71	35.60
	Male	:	39.62	32.94	20.60	40.30
	Famale	:	26.34	18.98	12.10	30.50
Percent of Landless Families		:	32.78	9.867	41.96	62.00
Contraceptive PrevalenceRate		:	18.49	10.79	23.52	19.82

Appendix - D

Table 1 : Pregnancy outcome by mother and fetus

Fetus	Mother												Grand Total		
	Gopalpur			Raipura			Singra			Godagari					
	Alive	Dead	Total	Alive	Dead	Total	Alive	Dead	Total	Alive	Dead	Total	Alive	Dead	Total
Spontaneous Abortion	38	1	39	40	-	40	64	-	64	69	-	69	211	1	212
Induced Abortion	21	3	24	10	-	10	48	1	49	9	-	9	88	4	92
Still birth	70	4	74	51	6	57	62	2	64	30	2	32	213	14	227
Live birth	1891	1	1892	890	2	892	1704	4	1708	1626	3	1629	6111	10	6121
Neo-Natal survivor	1653	1	1654	808	1	809	1605	2	1607	1564	3	1567	5630	7	5637
Neo-Natal Death	238	-	238	82	1	83	99	2	101	62	-	62	481	3	484

* These two rows show the detailed break down of the row of live birth above.

Table 2 : Proportion of live birth, still birth and abortion by study area

Area	No. of pregnant women	No. of live birth	Percentage	No. of still birth	Percentage	Number of spont. abortion	Percentage	No. of induced abortion	Percentage	All abortion	Percentage
Gopalpur	2029	1892	93.25	74	3.65	39	1.92	24	1.18	63	3.10
Raipura	999	892	89.29	57	5.71	40	4.00	10	1.00	50	5.00
Singra	1885	1708	90.61	64	3.39	64	3.40	49	2.60	113	5.99
Godagari	1739	1629	93.67	32	1.84	69	3.97	9	0.52	78	4.49
Total	6652	6121	92.02	227	3.41	212	3.19	92	1.38	304	4.57

Table 3 : Age specific live birth rates by study area

Age of Mother	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of pregnant women	No. of live birth	Rate/ 1000 pregnant women	No. of pregnant women	No. of live birth	Rate/ 1000 pregnant women	No. of pregnant women	No. of live birth	Rate/ 1000 pregnant women	No. of pregnant women	No. of live birth	Rate/ 1000 pregnant women	No. of pregnant women	No. of live birth	Rate 1000 pregnant women
<15	1	1	1000.0	-	-	-	15	11	733.3	11	10	909.0	27	22	814.8
15-19	335	317	946.2	62	54	870.9	395	364	921.5	283	267	943.4	1075	1002	932.1
20-24	624	584	935.9	173	149	861.3	597	542	907.9	551	514	933.8	1945	1789	919.8
25-29	499	462	925.8	283	254	900.7	445	404	907.9	433	403	930.7	1660	1523	917.5
30-34	248	231	931.4	230	208	904.3	203	179	881.8	205	195	951.2	886	813	917.6
35-39	205	195	951.2	129	114	883.7	150	134	893.3	156	150	961.5	640	593	926.6
40-44	95	83	873.6	67	62	925.3	58	55	948.3	74	66	891.8	294	266	904.8
45-49	22	19	863.6	55	51	927.2	22	19	863.6	26	24	923.0	125	113	904.0
Total	2029	1892	932.5	999	892	892.8	1885	1708	906.1	1739	1629	936.7	6652	6121	920.2

Table - 4 : Age specific still birth rates by study area

Age of Mother	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of pregnant women	No. of still birth	Rate 1000 pregnant women	No. of pregnant women	No. of still birth	Rate 1000 pregnant women	No. of pregnant women	No. of still birth	Rate 1000 pregnant women	No. of pregnant women	No. of still birth	Rate 1000 pregnant women	No. of pregnant women	No. of still birth	Rate 1000 pregnant women
<15	1	-	-	-	-	-	15	1	66.6	11	1	90.9	27	2	74.1
15-19	335	12	35.8	62	5	80.6	395	9	22.8	283	5	17.6	1075	31	28.8
20-24	624	25	40.0	173	14	80.9	597	21	35.2	551	8	14.5	1945	68	34.9
25-29	499	20	40.0	283	15	53.0	445	18	40.4	433	8	18.5	1660	61	36.7
30-34	248	9	36.2	230	13	56.6	203	11	54.2	205	5	24.4	886	38	42.9
35-39	205	2	9.7	129	5	38.7	150	4	26.6	156	3	19.2	640	14	21.9
40-44	95	4	42.1	67	4	59.7	58	-	-	74	2	27.0	294	10	34.0
45-49	22	2	90.9	55	1	18.2	22	-	-	26	-	-	125	3	24.0
Total	2029	74	36.4	999	57	57.1	1885	64	3.4	1739	32	18.4	6652	227	34.12

Table - 5 : Age specific abortion rates by study area

Age of Mother	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of pregnant women	No. of Abortion	Rate 1000 pregnant women	No. of pregnant women	No. of Abortion	Rate 1000 pregnant women	No. of pregnant women	No. of Abortion	Rate 1000 pregnant women	No. of pregnant women	No. of Abortion	Rate 1000 pregnant women	No. of pregnant women	No. of Abortion	Rate 1000 pregnant women
<15	1	-	-	-	-	-	15	3	200.0	11	-	-	27	3	111.1
15-19	335	6	17.9	62	3	48.4	395	22	55.79	283	11	38.9	1075	42	39.1
20-24	624	15	24.0	173	10	57.8	597	34	56.95	551	29	52.6	1945	88	45.2
25-29	499	17	34.0	283	14	49.6	445	23	51.68	433	22	50.8	1660	76	45.8
30-34	248	8	32.2	230	9	39.01	203	13	64.03	205	5	24.4	886	35	39.5
35-39	205	8	39.0	129	10	77.5	150	12	80.0	156	3	19.2	640	33	51.6
40-44	95	8	84.2	67	1	14.9	58	3	51.72	74	6	81.08	294	18	92.8
45-49	22	1	45.4	55	3	54.5	22	3	136.46	26	2	76.9	125	9	72.0
Total	2029	63	31.0	999	50	50.1	1885	113	59.95	1739	78	44.8	6652	304	45.7

Table - 6 : Maternal age specific spontaneous and induced abortion rates by study area

Age	Gopalpur				Raipura				Singra				Godagari				TOTAL			
	Spontaneous abortion	Rate/1000 pregnant women	Induced abortion	Rate/1000 pregnant women	Spontaneous abortion	Rate/1000 pregnant women	Induced abortion	Rate/1000 pregnant women	Spontaneous abortion	Rate/1000 pregnant women	Induced abortion	Rate/1000 pregnant women	Spontaneous abortion	Rate/1000 pregnant women	Induced abortion	Rate/1000 pregnant women	Spontaneous abottion	Rate/1000 pregnant women	Induced abortion	Rate/1000 pregnant women
<15	-	-	-	-	-	-	-	-	3	200.0	-	-	-	-	-	-	3	111.1	-	-
15-19	4	11.9	2	5.9	3	48.4	-	-	19	48.1	3	7.6	9	31.8	1	3.5	35	32.6	6	5.5
20-24	10	16.0	5	8.0	8	46.2	2	11.5	21	35.2	13	21.8	28	50.8	2	3.6	67	34.4	22	11.3
25-29	12	24.0	5	10.0	9	31.9	5	17.7	12	26.9	11	24.7	20	46.2	2	4.6	53	31.9	23	13.9
30-34	4	16.1	4	16.1	8	34.7	1	4.3	7	34.5	6	29.5	5	24.4	-	-	24	27.1	11	12.4
35-39	4	19.5	4	19.5	9	69.7	1	7.7	-	-	12	80.0	3	19.2	-	-	16	25.0	17	26.6
40-44	5	52.6	3	31.6	1	14.9	-	-	1	17.2	2	34.5	3	40.5	3	40.5	10	34.0	8	27.2
45-49	-	-	1	45.4	2	36.3	1	18.2	1	45.4	2	90.90	1	38.5	1	38.5	4	32.0	5	40.0
Total	39	19.2	24	11.8	40	40.1	10	10.0	64	33.9	49	25.9	69	39.7	9	5.2	212	31.9	92	13.8

Table 7 : Fertility rate by age and area.

Age	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of fertile women	No. of cmw * who gave live birth	Rate/ 1000 fertile women	No. of fertile women	No. of cmw who gave live birth	Rate/ 1000 fertile women	No. of fertile women	No. of cmw who gave live birth	Rate/ 1000 fertile women	No. of fertile women	No. of cmw who gave live birth	Rate/ 1000 fertile women	No. of fertile women	No. of cmw who gave live birth	Rate/ 1000 fertile women
< 15	3174	1	0.3	3063	-	-	3902	11	2.8	4217	10	2.4	14356	22	1.5
15-19	2504	317	126.6	1849	54	29.2	2844	364	127.9	3053	267	87.5	10250	1002	97.8
20-24	2413	584	242.0	1661	149	89.7	2672	542	202.8	2771	514	185.5	9517	1789	187.9
25-29	2199	462	210.1	2332	254	108.9	2650	404	152.5	2517	403	160.1	9698	1523	157.0
30-34	1283	231	180.0	1890	208	110.1	1525	179	117.4	1649	195	118.3	6347	813	128.1
35-39	1253	195	155.6	1399	114	81.5	1386	134	96.7	1455	150	103.1	5493	593	107.9
40-44	934	83	88.9	1056	62	58.7	964	55	57.1	1408	66	46.9	4362	266	60.9
45-49	514	19	36.9	980	51	52.0	827	19	22.9	659	24	36.4	2980	113	37.9
Total	14274	1892	132.5	14230	892	62.7	16770	1708	101.8	17729	1629	91.9	63003	6121	97.2

* cmw—currently married women

Table 8 : Neo-natal mortality rates by study area

Area	No. of live birth	No. of Neo-nates survived	No. of Neo-nates death	Rate/1000 live birth
Gopalpur	1892	1654	238	125.8
Raipura	892	809	83	93.0
Singra	1708	1607	101	59.1
Godagari	1629	1567	62	38.1
All area	6121	5637	484	79.1

Table 9 : Maternal age specific neo-natal mortality rates of four areas

Age	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of live birth	No. of neo-natal death	Rate/ 1000 live birth	No. of live birth	No. of neo-natal death	Rate 1000 live birth	No. of live birth	No. of neo-natal death	Rate/ 1000 live birth	No. of live birth	No. of neo-natal death	Rate/ 1000 live birth	No. of live birth	No. of neo-natal death	Rate/ 1000 live birth
< 15	1	-	-	-	-	-	11	1	90.90	10	1	100.0	22	2	90.90
15-19	317	42	132.4	54	4	74.1	364	25	68.68	267	12	44 9	1002	83	82.83
20-24	584	62	106.1	149	14	93.9	542	28	51.66	514	14	27.2	1789	118	65.95
25-29	462	61	132.0	254	21	82.6	404	23	56.93	403	16	39.7	1523	121	79.44
30-34	231	26	112.5	208	21	100.9	179	13	72.62	195	5	25.6	813	65	79.95
35-39	195	31	158.9	114	10	87.7	134	7	52.23	150	7	46.6	593	55	92.75
40-44	83	12	144.5	62	7	112.9	55	4	72.72	66	5	75 7	266	28	105.26
45-49	19	4	210.5	51	6	117.6	19	-	-	24	2	83.3	113	12	106.19
Total	1892	238	125.8	892	83	93.0	1708	101	59.13	1629	62	38.0	6121	484	79.07

Table 10 : Proportion of neo-natal mortality by causes and by areas

Causes	Gopalpur		Raipura		Singra		Godagari		Total	
	Number of death	Percen-tage	Number of death	Percen-tage	Number of death	Percen-tage	Number of death	Percen-tage	Number of death	Percen-tage
Prematurity	9	3.78	-	-	7	6.93	-	-	16	3.31
Birth Trauma/ Asphyxia	38	15.96	14	16.87	15	14.85	8	12.90	75	15.49
Tetanus	127	53.37	23	27.71	39	38.61	35	56.45	224	46.28
Pneumonia/ Fever/Sepsis	45	18.90	24	28.92	22	21.78	9	14.52	100	20.66
Diarrhoea	3	1.27	10	12.05	6	5.94	8	12.90	27	5.58
Congenital defect	-	-	-	-	1	0.99	1	1.61	2	0.41
Sudden death	-	-	-	-	2	1.98	-	-	2	0.41
Others	16	6.72	12	14.45	9	8.91	1	1.61	38	7.85
Total	238	100.0	83	100.0	101	99.99	62	99.99	484	99.99

Table 11 : Age specific maternal mortality rate

Age	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live. birth	No. of mate-rnal death	Rate/ 1000 live birth
<15	1	-	-	-	-	-	11	-	-	10	-	-	22	-	-
15-19	317	-	-	54	1	18.5	364	1	2.7	267	1	3.7	1002	3	2.9
20-24	584	2	3.4	149	2	13.4	542	3	5.5	514	3	5.8	1789	10	5.6
25-29	462	2	4.3	254	2	7.9	404	1	2.5	403	-	-	1523	5	3.3
30-34	231	1	4.3	208	2	9.6	179	-	-	195	1	5.1	813	4	4.9
35-39	195	3	15.3	114	-	-	134	1	7.5	150	-	-	593	4	6.7
40-44	83	1	12.0	62	1	16.1	55	-	-	66	-	-	266	2	7.5
45-49	19	-	-	51	-	-	19	1	52.6	24	-	-	113	1	8.8
Total	1892	9	4.7	892	8	8.96	1708	7	4.09	1629	5	3.1	6121	29	4.7

Table 12 : Maternal mortality rates by two age categories and by area.

Age	Gopalpur			Raipura			Singra			Godagari			Total		
	No. of live birth	No of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No. of mate-rnal death	Rate/ 1000 live birth	No. of live birth	No of mate-rnal death	Rate 1000 live birth
<30	1364	4	2.9	457	5	10.9	1321	5	3.8	1194	4	3.3	4336	18	4.2
>30	528	5	9.5	435	3	6.9	387	2	5.2	435	1	2.3	1785	11	6.2

Table 13 : Maternal death in relation to the stage of pregnancy by age

Age of mother	Stage of pregnancy						Total
	During pregnancy		During delivery		Post partum		
< 15	-		-		-		-
15-19	-		1		2		3
20-24	1		3		6		10
25-29	1		1		3		5
30-34	1		2		1		4
35-39	4		-		-		4
40-44	-		-		2		2
45-49	-		-		1		1
Total	7	24.1%	7	24.1%	15	51.7%	29

Table 14 : Maternal deaths by causes of death by study area

Causes	**Gopalpur**		**Raipura**		**Singra**		**Godagari**		**Total**	
	Deaths	%	Deaths	%	Deaths	%	Deaths	%	Deaths	%
Eclampsia/ Tetanus/ Convulsion.	2	22.2	5	62.5	1	14.3	3	60.0	11	37.9
Haemorrhage due to abortion.	4	44.4	-	-	-	-	-	-	4	13.8
Excessive bleeding before delivery	-	-	1	12.5	1	14.3	-	-	2	6.9
Excessive bleeding after delivery	-	-	1	12.5	-	-	2	40.0	3	10.3
Prolonged labour	1	11.1	-	-	-	-	-	-	1	3.4
Retained plancenta	2	22.2	-	-	2	28.6	-	-	4	13.8
Sepsis/Fever Foul Discharge	-	-	1	12.5	1	14.3	-	-	2	6.9
Induced abortion	-	-	-	-	1	14.3	-	-	1	3.4
Others	-	-	-	-	1	14.3	-	-	1	3.4

Table 15 : Maternal deaths in relation to child birth status at death and by age

Age of Mother	Child birth status at death					Total
	Prior to delivery	During delivery	Post Partum			
			0 — 7	8 — 21	22 — 42	
< 15			-			-
15-19		1	2			3
20-24	1	3	6			10
25-29	1	1	2	1		5
30-34	1	2	1			4
35-39	4					4
40-44			1		1	2
45-49					1	1
Total	7	7	12	1	2	29

Table 16 : Some Socio-Economic and Demographic Information of nine Maternal Death Cases in Gopalpur

Age of Mother	Educational Level	No. of living children	No. of children died	Abortion Experience	No. of Pregnancy at death	Stage of Preg. at death	Causes of death	Type of Treatment given	Availability of health facilities & distance	Economic Solvency status	Land ownership
32	0	5	1	No	7th	4 Months (abortion)	Hemorrhage	Private Doctor	1-2 miles	Solvent	No land
35	0	1	0	No	2nd	7 Months (abortion)	Hemorrhage	Herbal	3-4 miles	Hardship	No land
27	V	0	0	No	Ist	4 Months (abortion)	Hemorrhage	Govt. Doctor	1-2 miles	Deficit	360 decimal
20	0	0	0	No	1st	After delivery (live birth)	Eclampsia	Govt. Doctor	<1 mile	Hardship	No land
40	0	7	1	1 (spn)	10th	After delivery (still birth)	Prolonged labor	Private Doctor	No Health Centre	Solvent	120 decimal
25	0	2	0	No	3rd	After delivery (still birth)	Retained Placenta	Govt. Doctor	Don't know	Solvent	No land
38	0	3	2	No	6th	3 Months (abortion)	Hemorrhage	Private Doctor	Don't know	Deficit	120 decimal
36	0	3	7	No	11th	8 Months (still birth)	Eclampsia	Govt. Doctor	No Health Centre	Hardship	60 decimal
20	0	0	0	No	1st	After delivery (still birth)	Retained Placenta	Govt. Doctor	3-4 miles	Hardship	07 Decimal

Table 16 : Some Socio-Economic and Demographic Information of eight Maternal Death Cases in Raipura

Age of Mother	Educational Level	No. of living children	No. of children died	Abortion Experience	No. of Pregnancy at death	Stage of Preg. at death	Causes of death	Type of Treat-ment given	Availability of Health facilities and distance	Economic Solvency of the family	Land ownership of the family.
16	0	0	0	0	1st	After giving still birth (9 months)	Eclampsia	Govt. Doctor	5-6 miles	Solvency	51-100 decimal
20	0	0	0	0	1st	4 days after delivery	Fever/Sepsis	No one	Do not know the distance	Solvent	51-100 decimal
20	0	0	0	0	1st	At the time of labour pain but before delivery	Eclamspsia	No one	11-12 miles	Hardship	No land
25	0	0	0	0	1st	At the time of labour pain but before delivery	Eclampsia	No one	No facility	Deficit	50 or less than 50 Dec.
28	0	2	2	0	5th	After giving still birth (9 months)	Eclampsia	Govt. Doctor	5-6 miles	Surplus	51-100 decimals
30	0	5	0	0	6th	After giving live birth	Tetanus	Govt. Doctor	5-6 miles	Solvent	50 or less than 50 decimal
30	0	3	2	0	6th	After labour Pain but before delivery	Excessive Bleeding be-fore delivery	Govt. Doctor	Have facility but do not know the distance	Solvent	51-100 Decimals
40	0	6	1	0	8th	After giving still birth (9 months)	Excessive Bleeding after delivery	Homeopathic	3-4 miles	Hardship	50 or less than 50 decimals

Table 16 : Some Socio-Economic and Demographic Information of seven Maternal Death Cases in Singra

Age of mother	Educational Level	No. of living children	No. of children died	Abortion Experience	No. of Pregnancy at death	Stage of Preg. at death	Causes of death	Type of Treat-ment given	Availability of Health facilities and distance	Economic solvency of the family	Land ownership of the family
16	0	0	0	0	1st	After giving live birth	Retained Placenta	Para medic/ Village Doctor	Less than one mile	Unknown	Unknown
39	0	7	0	0	8th	At the time of Abortion (3 months)	Induced Abortion	Paramedic/ Village Doctor	5-6 miles	Solvent	251-300 Decimal
24	0	1	2	0	4th	After giving live birth	Sepsis/Fever	Paramedic/ Village Doctor	No facility	Deficit	00
25	0	0	0	0	1st	After giving still birth	Others	Govt. Doctor	No facility	Solvent	00
20	0	1	0	0	2nd	after giving still birth	Retained Placenta	Govt. Doctor	No facility	Hardship	51-100 decimal
45	0	10	1	0	12th	After Giving live birth	Tetanus/ Eclapmsia	Govt. Doctor	1-2 miles	Deficit	451-500 decimal
22	III	1	O	Unknown	2nd	Unknown	Excessive Blee-ding before delivery	Unknown	Less than One mile	Solvent	50 - less than 50 decimal

Table 16 : Some Socio-Economic and Demographic Information of five Maternal Death Cases in Godagari

Age of Mother	Educational Level	No. of living children	No. of children died	Abortion Experience	No. of Pregnancy at death	Stage of Preg. at death	Causes of death	Type of Treatment given	Availability of Health facilities and distance	Economic Solvency of the family	Land ownership of the family
30	0	2	0	No	3rd	During delivery	Hemorrhage	Private Doctor	1-2 miles	Solvent	No land
18	0	0	0	No	1st	After delivery (still birth)	Tetanus/ Eclampsia	Govt. Doctor	< 1 mile	Hardship	60 decimal
20	X	0	0	No	1st	After delivery (Live birth)	Tetanus/ Eclampsia	Govt. Doctor	7-8 miles	Surplus	750 decimal
20	0	1	0	No	2nd	After delivery (Live birth)	Hemorrhage	Govt. Doctor	1-2 miles	Hardship	No land
24	IV	3	0	No	4th	After delivery (Live birth)	Tetanus/ Eclampsia	Paramedic / Village Doctor	1-2 miles	Solvent	No land

Table 17 : Age and Sex Specific Death, 1985

Age	Gopalpur			Raipura			Singra			Godagari			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Neonatal	136	102	238	47	36	83	57	44	101	33	29	62	273	211	484
Infant	1	4	5	30	18	48	31	30	61	47	42	89	109	94	203
1-4	33	57	90	18	25	44	25	47	72	83	78	161	159	208	367
5-9	17	9	26	17	22	39	16	7	23	20	18	38	70	56	126
10-14	5	5	10	8	14	22	6	6	12	12	9	21	31	34	65
15-19	8	3	11	12	6	18	1	-	1	9	7	16	30	16	46
20-24	1	4	5	12	4	16	2	5	7	4	6	10	19	19	38
25-29	3	8	11	11	9	20	2	7	9	8	8	16	24	32	56
30-34	4	6	10	4	6	10	2	2	4	4	7	11	14	21	35
35-39	5	8	13	12	4	16	4	3	7	8	4	12	29	19	48
40-44	7	1	8	12	2	14	4	1	5	7	7	14	30	11	41
45-49	1	5	6	7	3	10	4	4	8	9	7	16	21	19	40
50-54	8	5	13	7	12	19	7	5	12	20	12	32	42	34	76
55-59	6	5	11	8	4	12	6	6	12	1	3	4	21	18	39
60-64	9	12	21	23	9	32	10	9	19	27	8	35	69	38	107
65 +	72	46	118	42	22	64	58	38	96	54	40	94	226	146	372
Total	316	280	596	270	197	467	235	214	449	346	285	631	1167	971	2143

Table 18 : Distribution of Population by Age, Sex and Marital Status (Gopalpur)

	Male						Female					
Age	Unmarried	Married	Divorced	Separated	Widower	Total	Unmarried	Married	Divorced	Separated	Widow	Total
< 1 Year	729					729	721					721
1-4	2685					2685	2689					2689
5-9	3860					3860	3637					3637
10-14	3549	1				3550	3142	32				3174
15-19	2635	56	2			2693	1377	1076	40	7	4	2504
20-24	1411	551	2	1	1	1966	192	2137	53	16	15	2413
25-29	624	1827	3	3	1	2458	32	2077	45	9	36	2199
30-34	111	1558	2	1	4	1676	4	1214	13	5	47	1283
35-39	33	1405	-	1	6	1445	3	1159	8	-	83	1253
40-44	11	1152	2	3	8	1176	-	811	4	3	116	934
45-49	2	750	-	-	4	756	1	423	2	1	87	514
50-54	-	848	2	1	19	876	-	755	-	2	358	1115
55-59	1	439	-	-	12	452	1	282	2	-	164	449
60-64	1	651	-	-	30	682	-	227	-	1	394	622
65 +	-	976	1	-	110	1087	1	201	2	1	504	712
Total	15,652	10,214	14	10	195	26,085	11,800	10,394	169	45	1811	24,219

Table 18 : Distribution of Population by Age, Sex and Marital Status (Raipura)

	Male						Female					
Age	Unmarried	Married	Divorced	Separated	Widower	Total	Unmarried	Married	Divorced	Separated	Widow	Total
< 1 Year	707					707	690					690
1-4	3216					3216	3222					3222
5-9	4112					4112	3696					3696
10-14	3559	10			1	3570	3035	26	1		1	3063
15-19	2550	25		1		2576	1370	437	34	6	2	1849
20-24	1485	243	2			1730	221	1365	63	8	4	1661
25-29	790	1150	1			1941	41	2229	46	3	13	2332
30-34	207	1749				1956	11	1814	23	3	39	1890
35-39	47	1848			2	1897	6	1330	14	1	48	1399
40-44	16	1295			5	1316	4	968	7	1	76	1056
45-49	4	973			6	983	3	894	3	1	79	980
50-54	5	1070			11	1086	4	862	3	1	341	1211
55-59	4	540	1		6	551	3	328			152	483
60-64	2	804			24	830		355	1		272	628
65+	9	1093	1		86	1189	1	363	1		603	965
Total	16,713	10,800	5	1	141	27,660	12,307	10,971	196	24	1627	25125

Table 18 : Distribution of Population by Age, Sex and Marital Status (Singra)

	Male						Female					
Age	Unmarried	Married	Divorced	Separated	Widower	Total	Unmarried	Married	Divorced	Separated	Widow	Total
< 1 Year	737					737	817	1				818
1-4	3595	2				3597	3384	6				3390
5-9	4872	8	1			4881	4661	12			2	4675
10-14	4396	11	1			4408	3825	71	2	1	3	3902
15-19	3038	117	4	1	1	3161	1429	1341	40	28	6	2844
20-24	1538	827	6	2	3	2376	158	2378	73	45	18	2672
25-29	497	2008	3	3	6	2517	19	2496	50	38	47	2650
30-34	94	1779	3	-	4	1880	1	1443	21	13	47	1525
35-39	32	1572	3	1	15	1623	4	1290	11	7	74	1386
40-44	13	1070	4	2	10	1099	-	844	3	5	112	964
45-49	12	932	1	-	4	949	2	692	4	6	123	827
50-54	7	830	-	1	22	860	3	722	3	8	338	1074
55-59	1	531	1	1	14	548	4	323	1	2	169	499
60-64	2	694	1	-	32	729	1	255	-	1	320	577
65+	2	1174	-	1	121	1298	8	238	-	2	635	883
Total	18,836	11,555	28	12	232	30,663	14,316	12,112	208	156	1894	28,686

Table 18 : Distribution of Population by Age, Sex and Marital Status (Godagari)

	Male						Female					
Age	Unmarried	Married	Divorced	Separated	Widower	Total	Unmarried	Married	Divorced	Separated	Widow	Total
< 1 Year	874					874	846					846
1-4	3407					3407	3311					3311
5-9	4733					4733	4454	5				4459
10-14	4456	1				4457	4129	85	3			4217
15-19	3237	134				3371	1846	1149	38	12	8	3053
20-24	1733	797	2		2	2534	433	2232	64	29	13	2771
25-29	652	1746	1	3	5	2407	105	2301	52	30	29	2517
30-34	138	1879	1	3	7	2028	10	1526	34	13	66	1649
35-39	32	1445	3	2	7	1489	8	1339	16	5	87	1455
40-44	7	1538	1	3	11	1560	3	1220	9	9	167	1408
45-49	-	766	-	1	10	777	1	574	3	3	78	659
50-54	2	1263	-	-	18	1283	6	856	7	2	353	1224
55-59	-	466	-	-	14	483	-	271	1	3	169	444
60-64	1	847	1	1	26	876	-	206	1	1	312	520
65+	1	740	1	-	65	807	-	92	2	2	313	409
Total	19,273	11,622	10	13	165	31083	15,152	11,856	230	109	1,595	28,942

Table 19 : Vital rates by project sites.

Study Area	CBR	CDR	NGR	NMR	MMR
Gopalpur	37.6	11.85	2.6	126.0	4.75
Raipura	16.89	8.45	0.84	93.05	8.96
Singra	28.78	7.55	2.1	59.13	4.09
Godagari	27.14	10.59	1.7	38.0	3.06
All area	27.51	9.62	1.8	79.07	4.37

Appendix - E

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